tau-tron

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Specifications
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PLEASE SEE NEXT PAGE FOR INSTRUCTIONS
FOR RECEIVING FINAL INSTRUCTION MANUAL.

IMPORTANT

In order not to delay shipment of your instrument, we have shipped it without a printer interface card. We will retrofit your unit with this card as soon as they are available.

MB-302
BERT RECEIVER

Preliminary
Instruction Manual
Form 146-1080A

Digitized by the Internet Archive
in 2025

https://archive.org/details/manualsplus_10522

Important:

In order not to delay shipment of your instrument we have provided a preliminary manual. Although incomplete, this manual does provide sufficient information for you to understand and operate the instrument.

To receive a final manual please complete, detach, and mail the lower card.

If you would like a representative to call, require additional information, or would like to be placed on our mail list to receive **The Pulse** or other useful technical information, please complete, detach, and mail the card below.

Please —

☐ Have representative call.

☐ Add me to your mail list.

Send additional information on:

☐ Bit Error Rate Test Equipment
☐ Data/Word Generators
☐ Data Loggers
☐ High-Speed Components

My general application is _____

Name _____ Title _____

Company _____ Dept./MS _____

Address _____ City _____

State&Zip _____ Phone _____

Form 148A-1080B

Send final manual for:

Model(s) _____

Serial Number(s) | | | | | | | | |

to:

Name _____ Title _____

Company _____ Dept./MS _____

Address _____ City _____

State&Zip _____ Phone _____

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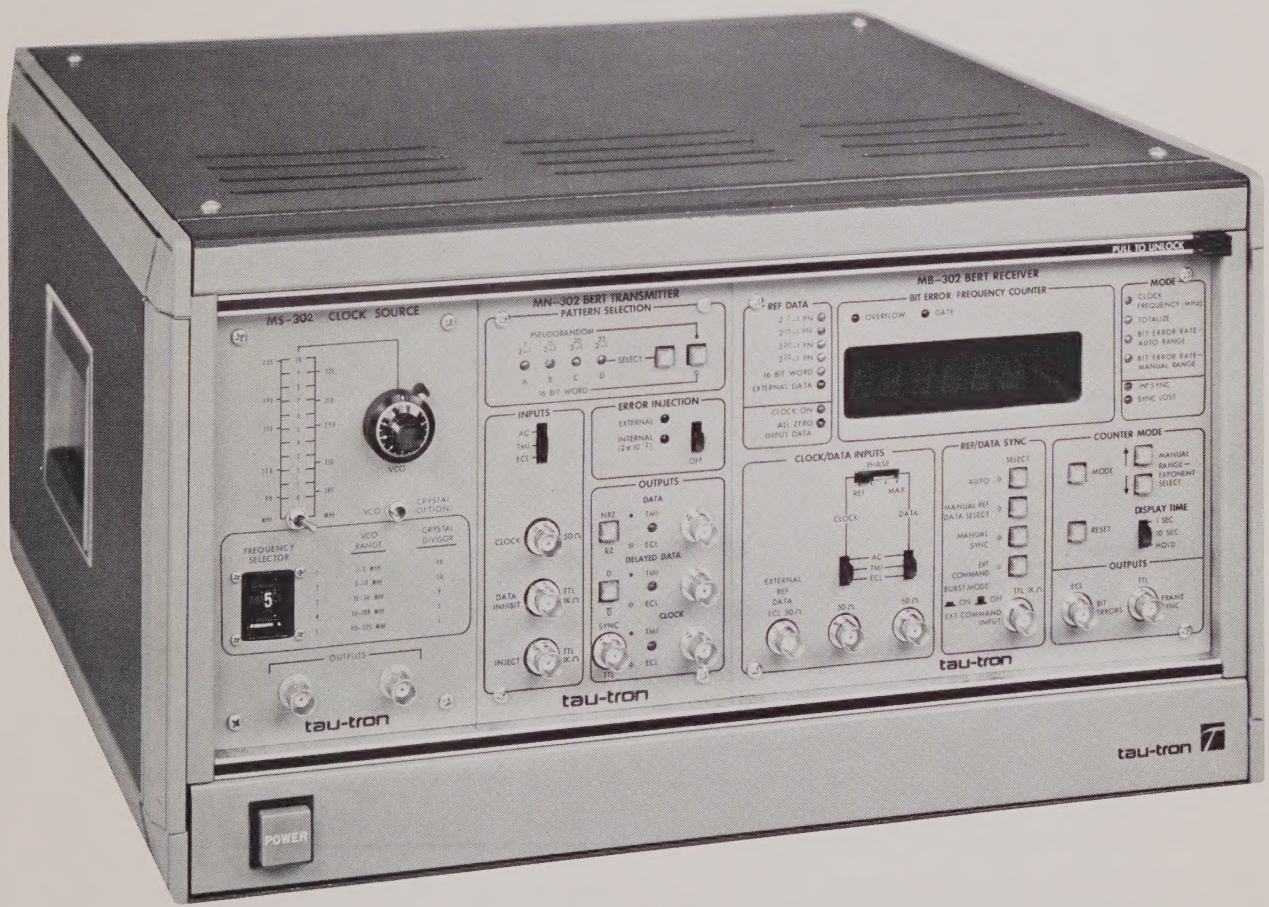
tau-tron

BERTS-325C
Bit Error Measurement System



- Error-rate testing to 325MHz
- Four pseudorandom sequences to $2^{23}-1$ bits
- Four 16-bit fixed words
- Automatic reference-data selection and synchronization
- Auto ranging bit error-rate measurements
- Provision for external reference data
- Burst-error mode operation
- Printer output or optional GPIB (IEEE-488)

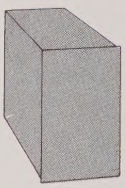
The Tau-Tron BERTS-325C Bit Error Measurement System is a complete modular test set for bit error-rate measurements up to 325 MHz. It generates both pseudorandom and fixed 16-bit patterns for stimulating the system under test and measures the bit-by-bit errors on the patterns as they are received from the system under test. Bit error-rate on total errors can be measured on continuous data, or on burst data for such applications as TDMA testing. Data and delayed-data outputs are included to facilitate QPSK test applications and a printer output is standard for automatic data logging.

TMI PERFORMANCE VERSATILITY ECONOMY

TMI—Tau-Tron Modular Instrument—a system concept that allows custom instrumentation at off-the-shelf prices. Over 15 different modules are available for signal generation, conditioning, and detection, data and word generation, and data logging. Modules are constantly being added or up-graded to meet new applications or changing requirements.

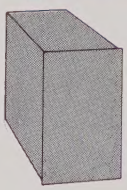
TMI Signal Definition: 1 + 0.2 - 0.1V into or behind 50Ω to ground with baseline of 0 ± 0.1V, distortion of ±7% max terminated, and transition times of 1ns max.

Frequencies to 650 MHz



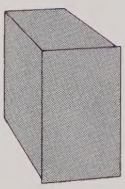
The ME-302 Rate Extender works with the MN-302 Bert Receiver at four different pattern lengths to extend the upper frequency to 650 MHz.

Signal Conditioning to 100 MHz



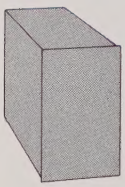
The MA-101 Dual Channel Amplifier provides a wide variety of input and output levels including direct interconnect to standard ECL and TTL levels.

Signal Conditioning to 325 MHz



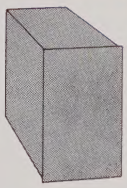
The MA-301 Dual Channel Amplifier provides input/output conditioning over the full 1kHz to 325MHz range of the BERTS-325C, including variable input thresholds and output amplitudes.

Signal Conditioning to 550 MHz



The MA-550 Dual Channel Amplifier is designed for use with the ME-302 to provide flexible input and output levels for the system under test.

The Future



Future TMI modules will extend the full capabilities of the BERTS instrumentation and will provide a wide choice of signal encoding and decoding. TMI is designed for your application today—and tomorrow.

Pseudorandom or Fixed-Word Testing to

Flexible Test Patterns

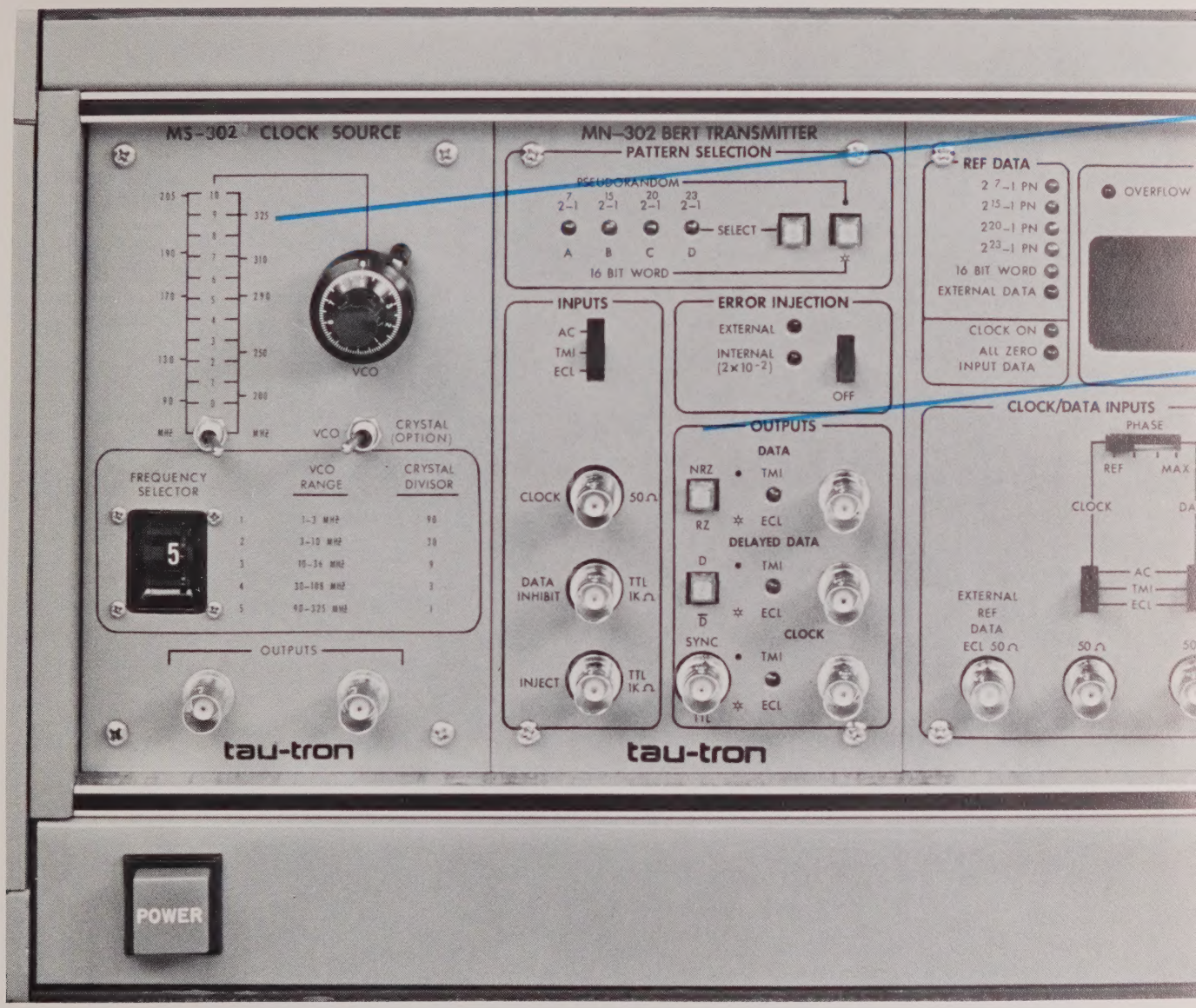
A choice of eight different test patterns allows a great deal of testing flexibility. Pseudorandom sequence of 2^7-1, $2^{15}-1$, $20^{20}-1$, or $2^{23}-1$ can be generated as well as four different 16-bit fixed words; all at rates from 1kb/s to 2Mb/s.

Internal error injection of 2 errors every 100 bits or external error injection can be selected. Two data outputs are provided, one with either NRZ or RZ format at either TMI or ECL levels, and one delayed by eight bits with NRZ format, true or complemented, at either TMI or ECL levels.

Convenient, Automatic Operation

Four modes of operation are possible to meet widely varying requirements. The simplest and most convenient is the automatic mode in which the receiver automatically selects the reference-data pattern, synchronizes on it, and provides front-panel indications of the pattern selected and an in-sync condition.

For applications where high error rates are expected, a manual mode is provided in which the reference-data pattern is selected manually and synchronization is initiated by a pushbutton. Sync acquisition can also be initiated by an external signal in a third mode of opera-



MHz with TMI Flexibility and Performance

tion. The fourth mode allows measurements to be made using an external reference.

Bright, Concise Answers

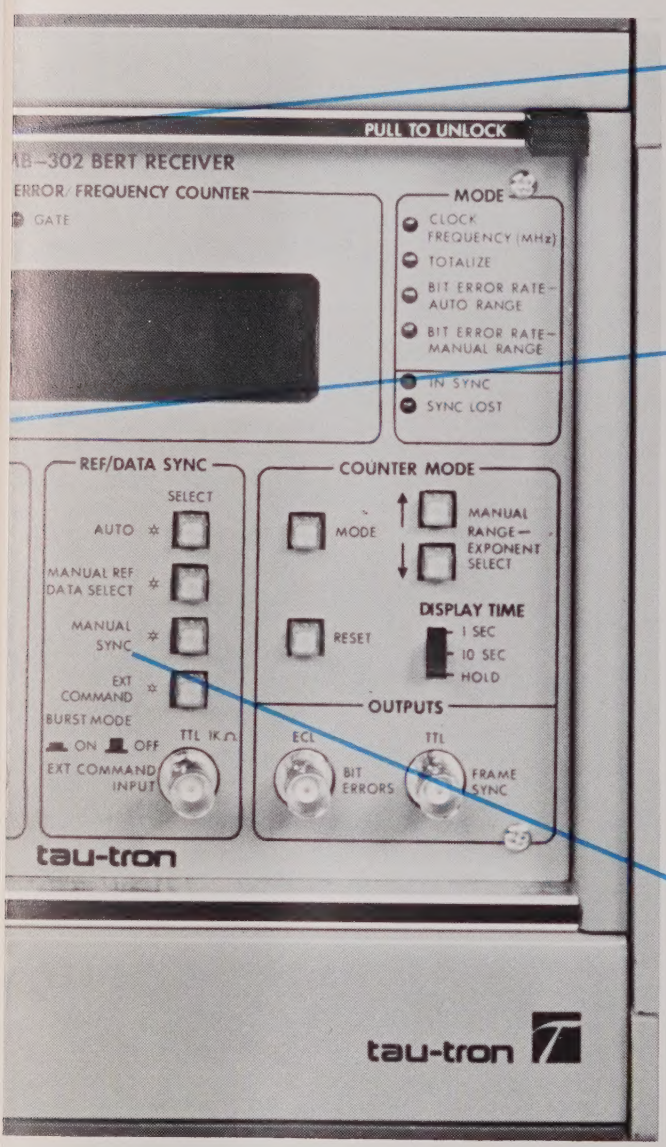
Measurement values are provided on a large, bright, easily-read display. One measurement is of the total number of errors and the display accumulates the errors indefinitely up to six digits plus overflow.

Bit error-rate measurements are also possible, with or without auto-range selection. Eight ranges are used, from 10^{-2} to 10^{-9}, and the display consists of three digits plus a one-digit exponent.

The last measurement is of the clock frequency, in MHz with 1kHz resolution. Measurements can be displayed for 1 second or 10 seconds with auto reset and start, or can be displayed indefinitely with manual reset.

Added Output Versatility

For automatic data logging the BERTS-325C includes a printer output with parallel BCD interface and strobe/busy handshake that is compatible with many standard laboratory printers, including the Tau-Tron MR-1 Data Logging Printer. Optionally, this output can be replaced by a GPIB (IEEE-488) interface to allow the system to



The Clock

- **1kHz to 325 MHz**

The TMI MS-302 Clock Source generates the system clock signal at frequencies from 1kHz to 325MHz, continuously adjustable over seven ranges. Up to three crystal-controlled oscillators can also be provided, optionally, for specific test frequencies. The clock output is a one-volt signal suitable for driving a TMI data generator such as the MN-302.

The Transmitter

- **Pseudorandom sequences of 2^7-1, $2^{15}-1$, $2^{20}-1$, or $2^{23}-1$.**
- **Four different 16-bit fixed words.**
- **Internal error-rate injection of 2 errors every 100 bits.**
- **NRZ or RZ data output at TMI or ECL levels.**
- **True or complemented NRZ delayed data output at TMI or ECL levels.**

A TMI MN-302 Pseudorandom Generator is used as the transmitter to generate pseudorandom sequences or 16-bit fixed words up to 325 Mbits per second. Internal error injection of 2 errors every 100 bits can be selected or external error injection can be achieved. Data output is switch selectable as NRZ or RZ at either TMI or ECL levels. A second data output, delayed by 8 bits, is also provided, true or complemented, as well as separate clock and sync outputs for added versatility.

The Receiver

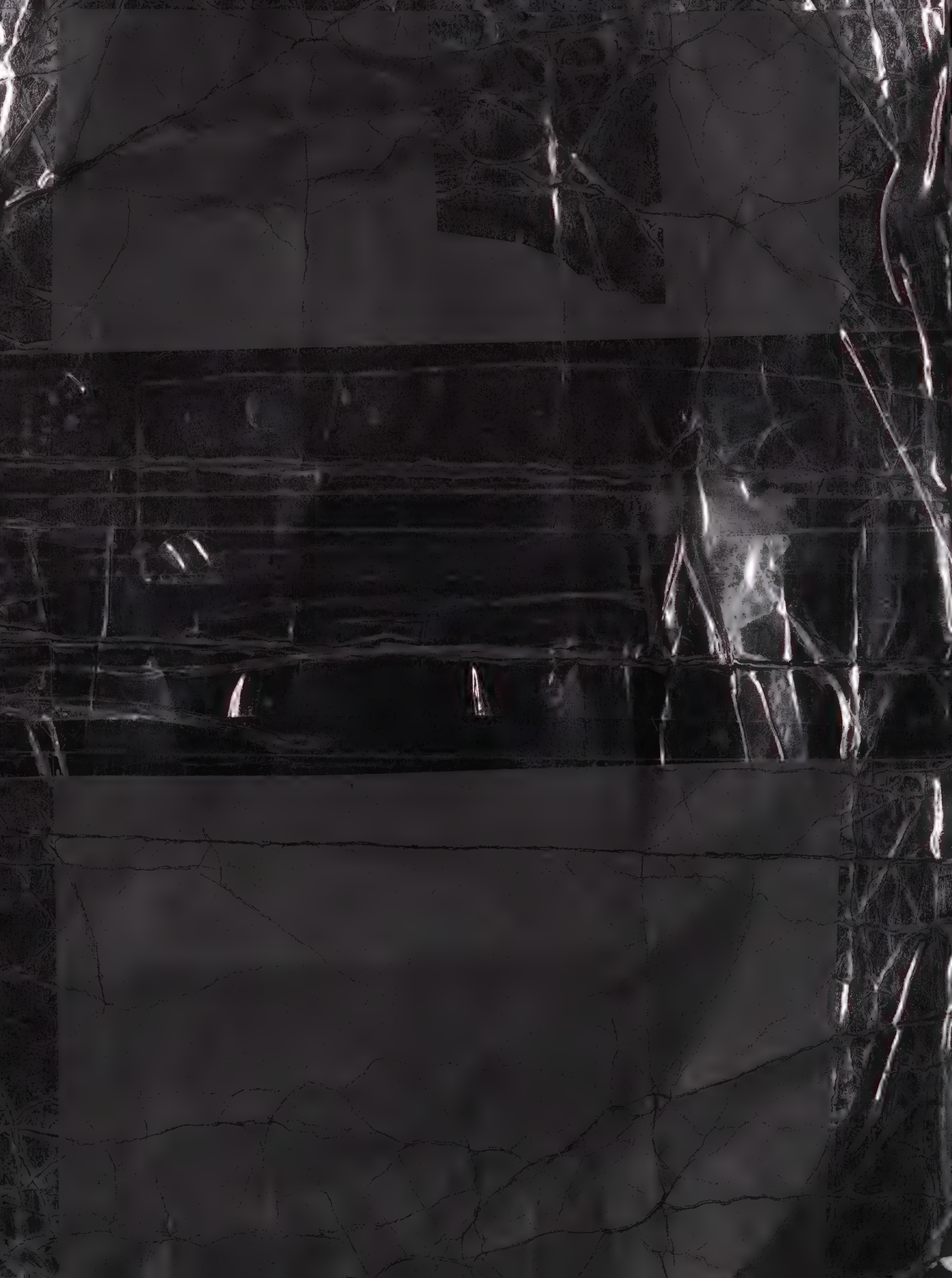
- **Totally automatic or manual sync**
- **Measures total errors or error rate**
- **Large, bright, easily-read display**
- **Printer output for automatic data logging**

The receiver is a TMI MB-302 BERT Receiver that provides the error-detection and error-measurement capabilities. It not only generates internal pseudorandom and fixed-word references but also allows the application of an externally applied reference for special requirements.

Four modes of operation are provided, including one that automatically selects the type of reference pattern being received and automatically synchronizes on it. Manual sync is also provided for high error-rate applications. Four different measurements are provided, each with switch selectable display times of 1 second, 10 seconds, or hold. In one measurement, detected errors are counted and displayed as total errors up to six digits, plus overflow. Two measurements display the error rate, one with and one without automatic range selection of 10^{-2} through 10^{-9}. The fourth measurement is that of the input clock frequency, in MHz with 1kHz resolution. All measurements are indicated on a large, bright, easily-read display, and the data are also available at a rear-panel connector for automatic logging.

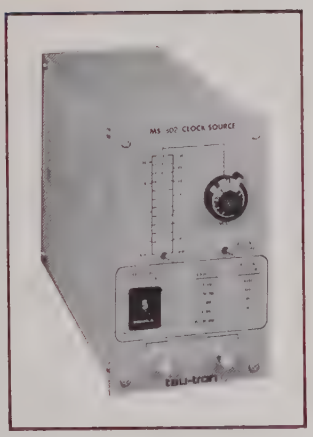
be controlled by a GPIB-compatible system controller.

Two monitor outputs are also provided, bit errors and reference-data frame sync. The bit-error output is useful with a complete system-test data logger such as the Tau-Tron S5000 Printing Error Analyzer, up to its maximum rate of 100 MHz.



CLOCK SPECIFICATIONS

MS-302 Clock Source



Variable Frequency: 1kHz to 325MHz, continuously variable by means of two front-panel controls in 7 decade ranges.

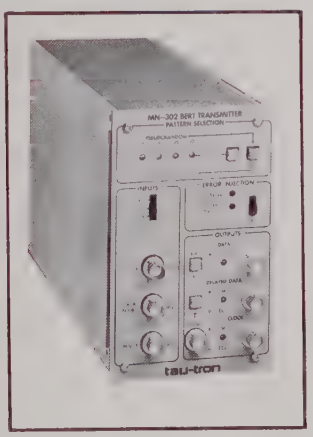
Crystal Frequency (Optional): 1MHz to 200MHz, supplied by up to 3 crystal-controlled oscillators. Internal switch selects which of the 3 oscillators is in circuit when 2 or more are installed. Output frequency can be divided down by 1, 10, 100, 1000, or 10,000 as set by a front-panel switch.

Output Amplitude: TMI level of 1 + 0.2 − 0.1V into 50Ω to ground, available at two front-panel BNC connectors.

Output Shape: Squarewave with transition times of 1ns max and distortion of ±7% max, terminated.

TRANSMITTER SPECIFICATIONS

MN-302 Pseudorandom Generator



Clock Input: Sinewave or squarewave, ECL, or ac coupling, front-panel controlled, into BNC connector. *TMI COUPLED:* 1kHz to 325MHz, 1V into 50Ω to ground, dc coupled. *ECL COUPLED:* 1kHz to 325MHz, 0.8V into 50Ω to −2V, dc coupled. *AC COUPLED:* 1MHz to 325MHz, 1V into 50Ω to ground, ac coupled.

Data Inhibit: TTL input of 2V min into 1kΩ to +5V at front-panel BNC connector, low-level active, 50ns min pulse width. Synchronously gates off output data, forcing output to logic−0; does not affect code generator output.

Data Patterns: Pseudorandom or fixed word, as selected by front-panel pushbuttons, with LED indicators. *PSEUDORANDOM:* 2^7-1 (127), $2^{15}-1$ (32,767), $2^{20}-1$ (1,048,575), or $2^{23}-1$ (8,388,607) bits. *FIXED WORDS:* 16-bit, A: 1010101010101010, B: 1011000-110110001, C: 1111010111110101, D: 1110010011100100.

Error Injection: Internal or external, LED indicated. *INTERNAL:* off or 2 errors per 100 data bits. *EXTERNAL:* TTL input of 2V into 1kΩ to +5V, front-panel BNC connector; rising edge triggers one-bit error; min pulse width of 50ns or 4 clock periods, whichever is longer.

Data Output: NRZ/RZ format. Internally selected as TMI signal of 1V into 50Ω to ground or as ECL signal of 0.8V into 50Ω to −2V; available at front-panel BNC connector.

Delayed Data Output: NRZ format, delayed 8-bits from Data Output. Front-panel controlled as true or complement signal, internally selected TMI output of 1V into 50Ω or as ECL output of 0.8V into 50Ω to −2V; available at front-panel BNC connector.

Clock Output: Waveshape follows clock input. Front-panel selected as TMI signal of 1V into 50Ω to ground or as ECL signal of 0.8V into 50Ω to −2V.

Sync Output: Squarewave output occurs once every 4 pseudorandom sequences or once every 4 fixed words.

RECEIVER SPECIFICATIONS

MB-302 BERT Receiver

Clock Input: Sinewave or squarewave; choice of TMI, ECL, or AC coupling, front-panel controlled, into BNC connector. A front-panel LED indicates when clock input is detected. *TMI COUPLED:* 1kHz to 325MHz, 1V into 50Ω to ground, dc coupled. *ECL COUPLED:* 1kHz to 325MHz, 0.8V into 50Ω to −2V, dc coupled. *AC COUPLED:* 1MHz to 325MHz, 1V into 50Ω to ground, ac coupled.

Data Input: Choice of TMI, ECL, or AC coupling, front-panel controlled, into front-panel BNC connector, *TMI COUPLED:* 1kHz to 325MHz, 1V into 50Ω to ground, dc coupled. *ECL COUPLED:* 1kHz to 325MHz, 0.8V into 50Ω to −2V, dc coupled. *AC COUPLED:* 1MHz to 325MHz, 1V into 50Ω to ground, ac coupled. *PHASE:* Front-panel phase control selects additional 3 steps of delay of input data relative to clock for proper clock/data phasing, approximately 3ns max delay.

Reference Data Input: 1kHz to 325MHz, ECL level of 0.8V into 50Ω to −2V. Must be externally aligned, bit-by-bit, with data input.

Command Input: TTL level of 2V min into 1kΩ to +5V. With burst-mode off, rising edge of this input triggers receiver sychronization. With burst-mode on, low level of this input inhibits error measurement and synchronization checking; and rising edge triggers synchronization (if necessary).

Data Patterns: Pseudorandom, fixed word, or external data. *PSEUDORANDOM:* 2^7-1 (127), $2^{15}-1$ (32,767), $2^{20}-1$ (1,048,575), or $2^{23}-1$ (8,388,607) bits. *FIXED WORD:* Any 16-bit repetitive pattern. *EXTERNAL DATA:* An external, synchronized reference pattern.

Synchronization: Four modes are available, automatic, manual, external, and external reference data, as selected by front-panel pushbuttons and indicated by front-panel LEDs. *THRESHOLD:* Sync is acquired and In-Sync front-panel LED lights when there are <32 pseudorandom errors or <16 fixed-word errors in a 200-bit sample. Sync is lost and Sync-Lost front-panel LED lights when pseudorandom error rate is > 1600 errors per 10,000 bits, or fixed error rate is > 800 errors per 10,000 bits. A front-panel LED also indicates when all 0s data input is detected. *AUTOMATIC:* Automatically syncs on proper pseudorandom code length or fixed-word and provides front-panel LED indication. *MANUAL:* Pseudorandom code length or fixed word selected manually by front-panel pushbutton, sync attempt is initiated each time front-panel button is pushed. *EXTERNAL:* Same as manual except sync attempt is initiated by a signal applied to External Command Input (see above). *EXTERNAL REFERENCE DATA:* A signal applied to External Reference Data input is used for comparison; sync acquisition and burst-mode operations are undefined.

Measurements: Four modes are available, as selected by front-panel pushbuttons and indicated by front-panel LEDs, each with display times of 1s, 10s or hold, switch selected. A LED also indicates when a measurement is in progress. A reset pushbutton resets the counter, display, and Sync-Lost LED. *TOTALIZE:* Errors accumulated indefinitely, 6 digits plus overflow; leading zeros blanked. *TIME RATE AUTO:* Bit error-rate measured with automatic

range selection of 10^{-2} through 10^{-9}, 3 digits plus 1-digit exponent. *TIME RATE MANUAL:* Bit error-rate measured with manual range selection of 10^{-2} through 10^{-9}, 3 digits plus 1-digit exponent. *CLOCK FREQUENCY:* Measures input clock frequency in MHz with 1kHz resolution, 6 digits.

Display: 6-digit, high-brightness, with 0.430 in. high digits and 0.280 in high exponent provides measurement data.

Error Output: One pulse per bit error, width follows clock input width, at ECL level of 0.8V into 50Ω to −2V, available at front-panel BNC connector. For use with automatic data loggers such as the Tau-Tron S5000 Printing Error Analyzer.

Sync Output: Squarewave occurring once every 4 pseudorandom sequences or every 4 16-bit fixed words, TTL level of 2.4V min into standard TTL load.

Printer Output: TTL compatible I/0 lines, positive true outputs and negative true inputs, available at rear-panel 50-pin D connector for use with external printer such as the Tau-Tron MR-1 Data Logging Printer. Lines include 6 BCD digits plus decimal point, printer strobe, printer busy input, and status lines for time rate auto, time rate manual, frequency, totalize, in sync, and sync lost.

GENERAL SPECIFICATIONS

Power: 115V ± 10% or 230V ± 10% ac, 48 to 66 Hz, 240VA, via a 6-foot detachable power cord (supplied) that connects to a rear-panel receptacle on mainframe. Mainframe contains dc supplies and cooling fans for modules.

Mechanical: Benchmount, blue-painted aluminum case with convenient carrying handles mounted on sides. Adaptors available for rack-mounting; see Option 05. *DIMENSIONS:* 9.5 in. high × 17.75 in. wide × 17.9 in. deep. *WEIGHT:* 47 lb net, 54 lb shipping.

Accessories Supplied: Ac power cable, instruction manual, mating connector for printer output (unless Option 02 IEEE-488 Interface is installed).

Accessories Available: S5000 Printing Error Analyzer for automatic data logging of system performance, MR-1 Data Logging Printer for automatic printout of measurement data, EC-1 Cable to connect module to mainframe with module removed for servicing ease.

Option 02 IEEE-488 Interface (GPIB): For remote control of clock source, transmitter, and receiver, replaces printer output.

Option 04 Crystal Frequency: From 1 to 3 different crystal-controlled oscillators are available for the MS-302 Clock Source for specific test frequencies between 1 and 200MHz; see Crystal Frequency under CLOCK SPECIFICATIONS.

Option 05 Rackmounting: Mainframe is adapted for mounting in a standard 19-in rack.

BERTS-325C Bit Error Measurement System, including MS-302 Clock Source, MN-302 Transmitter, MB-302 Receiver, and Mainframe.

Options for added capability:
OP-02 IEEE-488 Interface (GPIB)
OP-04 Crystal-Controlled Clock Frequency, 1 to 200 MHz:
- OP-04A One Oscillator, specify frequency
- OP-04B Two Oscillators, specify frequencies
- OP-04C Three Oscillators, specify frequencies

OP-05 Rackmounting

Accessories Available:
S5000 Printing Error Analyzer
MR-1 Data Logging Printer
EC-1 Cable for service ease

Specifications subject to change without notice.

tau-tron

Tau-Tron Inc. 27 Industrial Ave., Chelmsford, MA 01824
(617) 256-9013 TWX: 710-343-6781

Form 149-1080B Printed in U.S.A.

OPERATION

1. Use a BNC-terminated cable to connect clock signal from system under test to MB-302 CLOCK input and set level switch for desired level (AC, TMI, or ECL). CLOCK on indicator will light when clock signal is present.

2. Use a BNC-terminated cable to connect data signal from system under test to MB-302 DATA input and set level switch for desired level (AC, TMI, or ECL). ALL ZERO DATA input indicator will light when data is all zeros (not present).

3. Five modes of reference-data/sync are possible; all are selected by the AUTO pushbutton:

Auto/Auto	Push the AUTO button until the AUTO indicator lights. In this mode the reference data is selected automatically and displayed by means of the REF DATA indicators. Sync is also acquired automatically and a synchronized condition illuminates the IN SYNC indicator. If, at any time during a measurement, sync is lost, the SYNC LOST indicator will light.
Manual/Manual	Push the AUTO button until the MANUAL REF DATA SELECT and MANUAL SYNC indicators light. Push the MANUAL REF DATA SELECT button for the desired range (2^7-1 PN thru 2^{23}-1 PN or 16 BIT WORD). Push the MANUAL SYNC button to synchronize; a synchronized condition illuminates the IN SYNC indicator. If, at any time during a measurement, sync is lost, the SYNC LOST indicator will light.
Manual/External	Push the AUTO button until the MANUAL REF DATA SELECT and EXT COMMAND indicators light. Push the EXT COMMAND button so that it is in the out position. Push the MANUAL REF DATA SELECT button for the desired range (2^7-1 PN thru 2^{23} PN or 16 BIT WORD). Use a BNC-terminated cable to connect an external sync signal to the EXT COMMAND INPUT. A lo-to-hi transition of the external sync signal initiates sync; a synchronized condition illuminates the IN SYNC indicator. If, at any time during a measurement, sync is lost, the SYNC LOST indicator will light.

Manual/Burst

Push the AUTO button until the MANUAL REF DATA SELECT and EXT COMMAND indicators light. Push the EXT COMMAND button so that it is in the in position. Push the MANUAL REF DATA SELECT button for the desired pattern (2^{-1} PN thru 2^{23} PN or 16 BIT WORD).

Use a BNC-terminated cable to connect an external signal to the EXT COMMAND INPUT. A lo-level signal inhibits the measurement, a lo-to-hi transition initiates sync, and a hi-level enables the measurement.

External Reference

Push the AUTO button until the EXTERNAL DATA indicator lights. Use a BNC-terminated cable to connect synchronized reference data to the EXTERNAL REF DATA input.

4. Four measurement modes are possible; all are selected by the Counter MODE MODE pushbutton:

CLOCK FREQUENCY

Push the MODE button until the CLOCK FREQUENCY indicator lights. The display indicates the frequency in MHz, up to 6 digits, plus overflow, with 1 KHz resolution. The GATE indicator lights while a measurement is in progress.

TOTAL ERRORS

Push the MODE button until the TOTALIZE indicator lights. The display indicates the number of total errors accumulated after the RESET button is pushed, up to 6 digits plus overflow. The GATE indicator lights while the measurement is in progress. The measurement is stopped by pushing the RESET button.

ERROR RATE AUTO

Push the MODE button until the BIT ERROR RATE AUTO RANGE indicator lights. In this mode, the range is selected automatically from 10^{-2} thru 10^{-9}. The display indicates the error rate upt to 3 digits plus overflow with a 2-digit exponent. The GATE indicator lights while the measurement is in progress.

ERROR RATE MANUAL — Push the MODE button until the BIT ERROR RATE MANUAL RANGE indicator lights and the two MANUAL RANGE EXPONENT SELECT buttons light. Push the upper MANUAL RANGE EXPONENT SELECT button to increase the exponent as indicated on the display, or push the lower button to decrease it, until the desired range of from 10^{-2} to 10^{-9} is selected. The display indicates the error rate up to 3 digits plus overflow with a 2-digit exponent. The GATE indicator lights while the measurement is in progress.

5. Three different display times are possible, all are selected by the DISPLAY TIME switch : 1 SEC, 10 SEC, or HOLD. With the 1 SEC or 10 SEC times, the display is held for the indicated time, then both the measurement and display are automatically reset to zero and a new measurement is initiated. With the HOLD time, the display is held until the RESET button is pushed at which time the display resets to zero and a new measurement is initiated.

   NOTE: The BIT ERRORS output produces a pulse at an ECL level each time an error is detected during a measurement, independent of the measurement mode selected. This output would be connected to an external counter, for example, to count total errors while the MB-302 is measuring the error rate and thus producing a simultaneous indication of total errors and error rate.

LIST OF ILLUSTRATIONS

FINAL ASSEMBLY PL-54424
COUNTER BOARD PL-54362
FRONT PANEL PL-54359
BCD INTERFACE. PL-54431
RESYNC BOARD PL-54364

DIAGRAMS (Drafting Prints):

FINAL ASSY TEK-54424
COUNTER BOARD ASSY TDK-54362
COUNTER BOARD SCHEMATIC. TCX-54360
FRONT PANEL ASSEMBLY TDK-54359
FRONT PANEL SCHEMATIC. TCX-54357
BCD INTERFACE ASSEMBLY TDK-54431
BCD INTERFACE SCHEMATIC. TCJ-54429
RESYNC BOARD ASSEMBLY. TDK-54364
RESYNC BOARD SCHEMATIC TCX-54363
POWER SUPPLY SCHEMATIC TCJ-54421

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	2	REV PER PDC00730 SMT	9-5-80	BAC CWB
	3	REVISED PER PDC00763 SMT	10-31-80	BAC
	4	REV PER PDC00785 C.A.	11-14-80	BAC

WHERE APPLICABLE:
REMOVE ALL BURRS & BREAK SHARP EDGES TO 1/64.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: ANGLES ±
FRACTIONS ±
3 PLACE DECIMALS ±
2 PLACE DECIMALS ±
1 PLACE DECIMALS ±

CONTR NO.

DR [illegible] 11 June 80
CHK [illegible] 11-6-80
APPD

APPROVED

BY DIRECTION OF

tau-tron inc
Chelmsford, Ma. 01824

DRAWING TITLE
MODULE ASSEMBLY
PARTS LIST

NEXT ASS'Y	USED ON
	MB-302

APPLICATION

MATERIAL:

SIZE	CODE IDENT NO.	DRAWING NO.	REV
A		PL-54424	4

SCALE —/— MB-302 SHEET 1 OF 3

NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	STOCK NO.	QTY.	KIT	SHORT	COST EA.	TO.
7		CAPACITOR, CERAMIC, .1uf	VITRAMON	VK33BX104M	1014-4610	2				
8		CAPACITOR, SOLID TANT, 1uf	SPRAGUE	150D105X9035A2	1024-5110	3				
9		" " 4.7uf	SPRAGUE	150D475X9035B2	1024-5147	1				
0		" " 10 uf		150D106X9035B2	1024-5210	2				
1										
2		CONNECTOR, SERPA, RADIANT CONTACT			9303-0092	3				
3		SCREW, PHILIPS HD, 5-40 X 1/4 LG			PRODUCTION HARDWARE	12				
4		" PHILIPS HD, 5-40 X 3/8 LG			"	8				
5		" PAN HD 4-40 X 3/8 LG			"	12				
6		" " 6-32 X 3/8 LG			"	4				
7		" 4-40X 1/4 LG			"	4				
8										
9		WASHER, LOCK, INT TOOTH, #6			"	4				
0		" " " #5			"	12				
1		" " " #4.			"	10				
2		WASHER, FLAT, #4				2				
3		NUT, HEX, #4-40			"	12				
4		SCREW, FLAT HD, 4-40 x 3/8 LG			"	4				
5		SCREW, FLAT HD, 4-40 x 1/4 LG			"	8				
6		ASSEMBLY, COUNTER BD.	Tau-Tron	TDK-54362	9545-4362	1				
7		ASSY [illegible] DISPLAY BD.	Tau-Tron	TDK-54364	9545-4364	1				
		ASSY, BCD, INTERFACE BD.	Tau-Tron	TDK-54431	9545-4431	1				
9		ASSY FLIGHT PANEL DISPLAY BD	Tau-Tron	TDK-54357	9545-4357	1				
0		ADHESIVE	MASTERBOND	NO. 297	PROD HDWR	AR				
1		MODULE ASSEMBLY	Tau-Tron	TEK-54424		REF				
2		MODULE WIRING DIAGRAM	Tau-Tron	TDM-54423		REF				

TITLE MODULE ASSY PARTS LIST	SHEET 3 OF 3	JOB NO.	QTY. / TOTAL COST
WING NUMBER 01-54424	REV 4	SUBMITTED BY:	DATE:
		KITTED BY	DATE:

ITEM NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	STOCK NO.	QTY.	KIT	SHORT	COST EA.	TOTAL
1		PANEL, FRONT, MACHINE	Tau-Tron	TCG-54419	9705-4419	1				
2		PANEL, FRONT, SCREEN	Tau-Tron	TCH-54420	9705-4420	1				
3		PANEL, REAR, 8" BLANK	VERO	37-0646K	9350-0013	1				
4		PANEL, REAR, MACHINE	Tau-Tron	TCG-54426	9705-4426	1				
5		RAIL, GUIDE SET	VERO	37-7777F	9350-0011	2 SET				
6		RAIL, DRILLING, REWORK	Tau-Tron	TCG-54428	9705-4428	2 SET				
7		COVER, PROTECTIVE	Tau-Tron	TCG-54410	9705-4410	2				
8						-				
9		DISPLAY, WINDOW	Tau-Tron	TCG-54417	9725-4417	1				
10		CONNECTOR, POWER, 24 PIN	AMPHENOL	26-4100-24P	9300-0103	1				
11		CABLE ASSY, FLAT RIBBON	Tau-Tron	TBK-54439	9555-4439	1				
12		PC. HOLDER, BRACKET	Tau-Tron	TBG-54433	9705-4433	4				
13		P.C. CARD, HOLDER	Tau-Tron	TBG-54434	9705-4434	2				
14		REGULATOR, +5, +8 VOLTS	NATIONAL	LM340K-5.0	4200-340K-5	2				
15		REGULATOR, -5 VOLTS	NATIONAL	LM320K-05	4201-320K5.0	1				
16		TRANSISTOR	MOTOROLA	2N3055	3180-3055	1				
17		WASHER, FLAT #6			PROD HDWR	4				
18		CABLE ASSY, FLAT RIBBON, 50 POS	Tau-Tron	TCK-54440	9555-4440	1				
19		RESISTOR, 1/4W, ±5% 3Ω	ALLEN & BRADLEY		0022-1300	2				
20		" " " 12Ω	"		0022-2120	1				
21		" " " 150Ω	"		0022-3150	1				
22		" " " 300Ω	"		0022-3300	2				
23										
24		DIODE, RECTIFIER, 1 AMP	MOTOROLA	1N4001	2101-4001	2				
25		CONNECTOR, COAXIAL, PLUG			9301-0058A	3				
26		AMP, FEMALE, RECEPTICLE	AMP		9303-0044	7				

TITLE MODULE ASSEMBLY PARTS LIST	SHEET 2 OF 3	JOB NO.	QTY.	TOTAL COST
		SUBMITTED BY:		DATE:
DRAWING NUMBER PL-54424	REV 4	KITTED BY		DATE:

# Des. FRONT PANEL MACHINE Stk. # 9705-4419 Qty. Kit. TITLE MODULE ASSY	Job # Des. FRONT PANEL SCREEN Stk. # 9705-4420 Qty. Kit. TITLE MODULE ASSY	Job # Des. PANEL REAR BLANK Stk. # 9350-0013 Qty. Kit. TITLE MODULE ASSY	Job # Des. PANEL REAR MACHINE Stk. # 9705-4426 Qty. Kit. TITLE MODULE ASSY
# Des. RAIL GUIDE SET Stk. # 9350-0011 Qty. Kit. TITLE MODULE ASSY	Job # Des. RAIL, DRILLING Stk. # 9705-4428 Qty. Kit. TITLE MODULE ASSY	Job # Des. COVER, PROTECTIVE Stk. # 9705-4410 Qty. Kit. TITLE MODULE ASSY	Job # Des. DISPLAY, WINDOW Stk. # 9725-4417 Qty. Kit. TITLE MODULE ASSY
# Des. CONNECTOR, POWER 24 PIN Stk. # 9300-0001 Qty. Kit. TITLE MODULE ASSY	Job # Des. CABLE ASSY, FLAT RIBBON 16 POS Stk. # 9555-4439 Qty. Kit. TITLE MODULE ASSY	Job # Des. CABLE ASSY 50 FLAT, RIBBON POS Stk. # 9555-4440 Qty. Kit. TITLE MODULE ASSY	Job # Des. REGULATOR +5, +8V Stk. # 4200-340K-5 Qty. Kit. TITLE MODULE ASSY
# Des. REGULATOR -5V Stk. # LM320K-05 Qty. Kit. TITLE MODULE ASSY	Job # Des. TRANSISTOR 2N3055 Stk. # 3180-3055 Qty. Kit. TITLE MODULE ASSY	Job # Des. TRANSISTOR MJE2955 Stk. # 3174-2955 Qty. Kit. TITLE MODULE ASSY	Job # Des. RESISTOR 1/4W ±5% 3.5Ω Stk. # 0022-1300 Qty. Kit. TITLE MODULE ASSY
# Des. RESISTOR 1/4W ±5% 12Ω Stk. # 0022-2120 Qty. Kit. TITLE MODULE ASSY	Job # Des. RESISTOR 1/4W ±5% 150Ω Stk. # 0022-3150 Qty. Kit. TITLE MODULE ASSY	Job # Des. RESISTOR 1/4W ±5% 300Ω Stk. # 0022-3300 Qty. Kit. TITLE MODULE ASSY	Job # Des. IN4001 DIODE, 1AMP Stk. # 2101-4001 Qty. Kit. TITLE MODULE ASSY

MODEL NO. MB-302

SUBASSEMBLY ID MODULE ASSY

Job # Des. MP, FEMALE, RECEPTICLE Stk. # 9303-0004 Qty. Kit. TITLE MODULE ASSY	Job # Des. CAPACITOR, CERAMIC, .1uf Stk. # 1014-4610 Qty. Kit. TITLE MODULE ASSY	Job # Des. CAPACITOR SOLID TANT, 1uf Stk. # 1024-5110 Qty. Kit. TITLE MODULE ASSY	Job # Des. CAPACITOR, SOLID TANT, 4.7uf Stk. # 1024-5147 Qty. Kit. TITLE MODULE ASSY
Job # Des. CAPACITOR SOLID TANT, 10uf Stk. # 1024-5210 Qty. Kit. TITLE MODULE ASSY	Job # Des. ASSEMBLY COUNTER BD. Stk. # 9601-0620 Qty. Kit. TITLE MODULE ASSY	Job # Des. ASSEMBLY CODE, RESYNC BD. Stk. # 9601-0599 Qty. Kit. TITLE MODULE ASSY	Job # Des. ASSEMBLY ACD, INTERFACE Stk. # 9601 Qty. Kit. TITLE MODULE ASSY
Job # Des. ASSEMBLY FRONT PANEL DISPLAY Stk. # 9601-0612 Qty. Kit. TITLE MODULE ASSY	Job # Des. CONNECTOR COAXIAL, PLUG Stk. # 9301-0058A Qty. Kit. TITLE MODULE ASSY	Job # Des. P.C. HOLDER BRACKET Stk. # 9705-4433 Qty. Kit. TITLE MODULE ASSY	Job # Des. CONNECTOR, PERM. MOUNT CONTACT Stk. # 9303-0080 Qty. Kit. TITLE MODULE ASSY
Job # Des. P.C. CONNECTOR BRACKET Stk. # 9705-4437 Qty. Kit. TITLE MODULE ASSY	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE
Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE

MODEL NO. MB-302

SUBASSEMBLY ID MODULE ASSY

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	2	REV PER PDC # 00758 MRC	Oct 20, 80	BAC

WHERE APPLICABLE:
REMOVE ALL BURRS & BREAK SHARP EDGES TO 1/64.

	MB-302
NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES: ANGLES ±

FRACTIONS ±

3 PLACE DECIMALS ±

2 PLACE DECIMALS ±

1 PLACE DECIMALS ±

MATERIAL:

CONTR NO.

DR	[illegible]	7-21-80
CHK	[illegible]	7-21-80
APPD	[illegible]	[illegible]

APPROVED

BY DIRECTION OF

tau-tron INC
Chelmsford, Ma. 01824

DRAWING TITLE
PARTS LIST, COUNTER

SIZE	CODE IDENT NO.	DRAWING NO.	REV
A		PL-54362	2

SCALE	MB-302	SHEET 1 OF 3

ITEM NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	TAU-TRON STOCK NO.	QTY.	KIT	SHORT	PRICING COST EA.	TOTAL
1		RESISTOR, MF, 1/4W, 1%	ALLEN-BRADLEY	TYPE RN	0012-4100	1				
2		" 2.2K Ω " "			-4200	16				
3		" 4.7K Ω " "			-4470	1				
4		" 5.1K Ω " "			-4510	1				
5		" 10K Ω " "			-5100	1				
6		" 22K Ω " "	ALLEN-BRADLEY	TYPE RB	0012-5220	1				
7		" 180	"		0012-3180	2				
8		" 390	"		0012-3390	2				
9										
10										
11		CAPACITORS, .01μf			1013-8510	33				
12		" .47μf			1064-0847	2				
13		" .22μf			1013-8322	1				
14										
15										
16		" .33μf, 10V			1064-1233	2				
17										
18										
19										
20										
21										
22		7805C 4-48	FAIRCHILD		2112-4148	2				
23										
24		MALE POST	AMP		9303-0003	2				
25										
26										

TITLE: PARTS LIST, COUNTER M3-302	SHEET 2 OF 3	JOB NO.	QTY. / TOTAL COST
DRAWING NUMBER: PL-54362	REV 2	SUBMITTED BY:	DATE:
		KITTED BY	

ITEM NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	TAU-TRON STOCK NO.	QTY.	KIT	SHORT	PRICING COST EA.	PRICING TOTAL
27	U44	NE555V	SIGNETICS		4060-555V	1				
28	U21	" ,4072				1				
29	U35,	74LS00	T.I.		4012-74LS00	2				
30	U2,42	,74LS04			-74LS04	2				
31	U4,5,13,16,28	,74LS08			-74LS08	5				
32	U1,27,49	,74LS32			-74LS32	3				
33	U6,7,9,36,37	,74LS74			-74LS74	5				
34	U6	,74LS123			-74LS123	1				
35	U41	,74LS138			-74LS138	1				
36	U10	,74LS151			-74LS151	1				
37	U38,39	74LS157			-74LS157	3				
38	U43,48	,74LS161			-74LS161	2				
39	U20	,74LS172			-74LS174	1				
40	U8,33,38,45,	,74LS257			-74LS257	6				
41	U25	,74LS276			-74LS276	2				
42	U5,6,7,9,24,	,74LS490	T.I.		4012-74LS490	9				
43	U1	,OSCILLATOR,14 PIN DIP	VECTRON	#C0233A	7030-1001	1				
44	U36	74390	T.I		4012-7439D	1				
45										
46	J2,3	CONNECTOR,16 PIN DIP	ANSLEY	609-1678	9306-0012	2				
47										
48										
49		P.C BOARD PC0620-2	TAU-TRON		1001-0620	1				
50		ASSEMBLY			TCX-542b2	REF				
51		FACTORY			TCX-5[illegible]	REF				
52		SCHEMATIC			TCX-54260	REF				

TITLE PARTS LIST, M.P.-302 COUNTER	SHEET 3 OF 3	JOB NO.	QTY.	TOTAL COST	
DRAWING NUMBER PL-54362	REV Z	SUBMITTED BY:		DATE:	
		KITTED BY			

Job #	Job #	Job #	Job #
Des. 1KΩ, 1/2W RESISTOR	Des. 2KΩ, 1/8 W RESISTOR	Des. 4.7KΩ, 1/8W RESISTOR	Des. 5.1KΩ, 1/8W RESISTOR
Stk. # 0012-4100	Stk. # 0012-4200	Stk. # 0012-4470	Stk. # 0012-4510
Qty. Kit.	Qty. Kit.	Qty. Kit.	Qty. Kit.
TITLE MB-302 COUNTER	TITLE MB-302 COUNTER	TITLE MB-302 COUNTER	TITLE MB-302 COUNTER
Job #	Job #	Job #	Job #
Des. 10KΩ, 1/8W RESISTOR	Des. 20KΩ, 1/8W RESISTOR	Des. .01uf CAPACITOR	Des. 47uf CAPACITOR
Stk. # 0012-5100	Stk. # 0012-5200	Stk. # 1013-8510	Stk. # 1064-0847
Qty. Kit.	Qty. Kit.	Qty. Kit.	Qty. Kit.
TITLE MB-302 COUNTER	TITLE MB-302 COUNTER	TITLE MB-302 COUNTER	TITLE MB-302 COUNTER
Job #	Job #	Job #	Job #
Des. 220uf CAPACITOR	Des. 33uf 10V CAPACITOR	Des.	Des. IN4148 DIODE
Stk. # 1013-8322	Stk. # 1064-1233	Stk. #	Stk. # 2112-4148
Qty. Kit.	Qty. Kit.	Qty. Kit.	Qty. Kit.
TITLE MB-302 COUNTER	TITLE MB-302 CAPACITOR	TITLE	TITLE MB-302 CAPACITOR
Job #	Job #	Job #	Job #
Des. NE 555V	Des. IC, 14072	Des. IC, 74LS00	Des. IC, 74LS04
Stk. # 4060-555V	Stk. #	Stk. # 4012-74LS00	Stk. # 4012-74LS04
Qty. Kit.	Qty. Kit.	Qty. Kit.	Qty. Kit.
TITLE MB-302 COUNTER	TITLE MB-302 COUNTER	TITLE MB-302 COUNTER	TITLE MB-302 COUNTER
Job #	Job #	Job #	Job #
Des. IC, 74LS08	Des. IC, 74LS32	Des. IC, 74LS74	Des. IC, 74LS138
Stk. # 4012-74LS08	Stk. # 4012-74LS32	Stk. # 4012-74LS123	Stk. # 4012-74LS138
Qty. Kit.	Qty. Kit.	Qty. Kit.	Qty. Kit.
TITLE MB-302 COUNTER	TITLE MB-302 COUNTER	TITLE MB-302 COUNTER	TITLE MB-302 COUNTER

MODEL NO. MB-302

SUBASSEMBLY ID COUNTER

SHT 1 OF 2

Job # Des. IC, 74LS151 Stk. # 4012-74LS151 Qty. Kit. TITLE MB-302 COUNTER	Job # Des. IC, 74LS157 Stk. # 4012-74LS157 Qty. Kit. TITLE MB-302 COUNTER	Job # Des. IC, 74LS161 Stk. # 4012-74LS161 Qty. Kit. TITLE MB-302 COUNTER	Job # Des. IC 74LS192 Stk. # 4012-74LS192 Qty. Kit. TITLE MB-302 COUNTER
Job # Des. IC, 74LS257 Stk. # 4012-74LS257 Qty. Kit. TITLE MB-302 COUNTER	Job # Des. IC, 74LS276 Stk. # 4012-74LS276 Qty. Kit. TITLE MB-302 COUNTER	Job # Des. IC, 74LS490 Stk. # 4012-74LS490 Qty. Kit. TITLE MB-302 COUNTER	Job # Des. 14 PIN DIP OSCILL OR Stk. # 9080-1001 Qty. Kit. TITLE MB-302 COUNTER
Job # Des. P.C. BOARD Stk. # 9601-0620 Qty. Kit. TITLE MB-302 COUNTER	Job # Des. CONNECTOR, 16 PIN DIP Stk. # 9306-0012 Qty. Kit. TITLE MB-302 COUNTER	Job # Des. IC. 74390 Stk. # 4012-74390 Qty. Kit. TITLE MB-302 Counter	Job # Des. MALE POST Stk. # 9303-0003 Qty. Kit. TITLE MB-302 COUNTER
Job # Des. 180 1/8W RESISTOR Stk. # 0012-3180 Qty. Kit. TITLE MB-302 Counter	Job # Des. 390 1/8W Resistor Stk. # 0012-3390 Qty. Kit. TITLE MB-302 Counter	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE
Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE

MODEL NO. MB-302

SUBASSEMBLY ID COUNTER

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	1	UPDATED P/L 2/27/80 RAV	3/5/80	CLERP
	2	[illegible] BUDD 7-16-80		
	3	REVISED - PDC 00759 JJF 10-31-80	11-12-80	BAC SHM

WHERE APPLICABLE:
REMOVE ALL BURRS & BREAK SHARP EDGES TO 1/64.

TSK-54359	MB-302
NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES: ANGLES ±

FRACTIONS ±

3 PLACE DECIMALS ±

2 PLACE DECIMALS ±

1 PLACE DECIMALS ±

MATERIAL:

CONTR NO.

DR	[illegible]	[illegible]
CHK	[illegible]	3/4/80
APPD	S.H. McCormick	4/12/80
APPD		
APPD		

APPROVED

BY DIRECTION OF

tau-tron inc
Chelmsford, Ma. 01824

DRAWING TITLE PARTS LIST
FRONT PANEL DISPLAY PL

SIZE	CODE IDENT NO.	DRAWING NO.	REV
A		PL54359	3

SCALE —— MB 302 SHEET 1 OF 4

ITEM NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	TAG-TRON STOCK NO.	QTY.	KIT	SHORT	PRICING COST EA.	PRICING TOTAL
1		RESISTOR 1/4W 5% CARBON								
2		5.6Ω	ALLEN-[illegible]		0012-1560	2				
3		33Ω	"		-2330	6				
4		39Ω			-[illegible]	2				
5		51Ω			-2510	2				
6		47Ω			-2470	2				
7		120Ω			-3120	7				
8		100Ω			-3100	2				
9		160Ω			-3160	1				
10										
11		220Ω			-[illegible]	12				
12		270Ω			-3270	3				
13		390Ω			-3390	2				
14		470Ω			-3470	6				
15		1KΩ			-4100	3				
16		4.7KΩ			-4470	2				
17		5.1KΩ			-4510	1				
18		200KΩ			0012-6200	1				
19										
20										
21										
22		RESISTOR 1/4W 5% CARBON								
23										
24		51Ω	"		0022-2510	6				
25		750Ω	ALLEN-[illegible]		0022-3750	2				
—										

TITLE PARTS LIST FRONT PANEL DISPLAY BD.	SHEET 2 OF 4	JOB NO.	QTY. / TOTAL COST
DRAWING NUMBER D[illegible]	REV 3	SUBMITTED BY:	DATE:
		KITTED BY	DATE:

ITEM NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	TAU-TRON STOCK NO.	QTY.	KIT	SHORT	PRICING COST EA.	PRICING TOTAL
29										
30		[illegible]	[illegible]	[illegible] 29H-1-501	[illegible]	2				
31										
32		[illegible]								
33	50,12	SLIDE, 2P2T	ALCO	MA5-A-2370G	9201-0007	3				
34	51	SLIDE 2P4T	ALCO	53-24	9201-0005	1				
35	97	[illegible] MAINTAINED [illegible] YELLOW	LICON	39-13401	9205-0011	1				
36	54-6, 8-11	PUSH-[illegible], MOMENTARY [illegible]	LICON	39-12401	9207-0012	7				
37	U16	7408	T.I.	SN7408	4012-7408	1				
38										
39	U14	14520	"	MC14520B	4012-14520	1				
40	U15	14490 INTEGRATED CKT	MOTOROLA	MC14490	4012-14490	1				
41	U2, 12	74LS08	T.I	SN74LS08	4012-74LS08	2				
42	U1, 13	74S139	"	SN74S139	4012-74S139	2				
43	U10	TIL [illegible]	"	TIL [illegible]	4513-030A	1				
44	U9	5082-7736	H.P.	HP5082-7736	4513-7736	1				
45	U3-U8	5082-7653	H.P.	HP5082-7653	4513-7653	6				
46	U11	MM74C912	NATIONAL	MM74C912	4012-74C912	1				
47		DIODES								
48	D10, 12	IN4148			2112-4148	2				
49	CR7, 15	LED - GREEN T-1	MONSANTO	MV5274C	2274-5274	2				
50	D1-5, 11-14	LED - YELLOW T-1	"	MV5374C	2274-5374	9				
51	D6-9, 15, 16	LED - RED T-1	"	MV5774C	2274-5774	5				
52	Q3-28	TRANSISTOR, 2N4401			3224-4401	6				
53	U17-U18	CKT MOD TO-220 WITH HEAT SINK		TAU-TRON	9565-7 [illegible]	2				
54	Q1-2	TRANSISTOR, 2N4403			3224-4403	2				

TITLE [illegible] FRONT PANEL DISPLAY ED	SHEET 3 OF 4	JOB NO.	QTY. / TOTAL COST
DRAWING NUMBER PL54351	REV 3	SUBMITTED BY:	DATE:
		KITTED BY	DATE:

NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	TAU-TRON STOCK NO.	QTY.	KIT	SHORT	PRICING COST EA.	TOTAL
53		CAPACITORS								
54		.01 μf CHIP CAP			1054-4710	6				
55		33 μf, 10 VDC, TANTAL			1064-0333	4				
56		.01 UF, CERAMIC	VITRAMON	VK233W1042	1013-8510	9				
57		.01 UF, CERAMIC	ERIE	8121-100-651-103M	1013-8510E	18				
58										
59		CONNECTORS								
60	P1	EDGE, DUAL, 22 POS, PC MT	AMP	2-583640-1	9303-0081	1				
61	P2	" DUAL, 35 POS, PC MT	AMP	3-583715-3	9303-0082	1				
62		BNC BULKHEAD	KINGS	KC-74-46	9301-0001K	6				
63		SOCKET PINS	BUSSEY	# 741	1026-0004	24				
64	U10	16 PIN IC SOCKET	AUGAT	516-AR-10D3	9300-0030	1				
65	U2-U9	14 PIN IC SOCKET	AUGAT	514-AG-11F	9300-0048	7				
66	P3	HEADER, 20 PIN POLARIZED	BUSSEY	609-2027	1026-0054	1				
67	J3	SOCKET, 20 PIN POLARIZED	BUSSEY	609-2090	9306-0054	1				
68										
69		SCHEMATIC DWG		TCX-54357		SCH				
70		ARTWORK	TAU-TRON	TT0612-2	9601-0612	PWB				
71		FAB DRAWING		TDG-54358		FAB				
72		ASSEMBLY DWG		TDK-54359		ASY				
73		SPACER, PLASTIC, ROUND; .50 LG	H.H. SMITH	4161	PROD HDWR	16				
74		BRACKET, [illegible]	TAU-TRON	TBG-54418	1201-4418	1				
75		SCREW, SL PAN HD; 6-32 × 1/4			PROD-HDWR	6				
76		[illegible]			PROD-HDWR	6				
77		[illegible]			PROD-HDWR	3				
78		NUT, [illegible]			PROD-HDWR	6				

TITLE PARTS LIST FRONT PANEL DISPLAY BD	SHEET 4 OF 4	JOB NO.	QTY.	TOTAL COST	
DRAWING NUMBER PL54359	REV 3	SUBMITTED BY:		DATE:	
		KITTED BY		DATE:	

Job # s. RES, 5.6Ω, 1/8W k. # 0012-1560 y. Kit. TLE MB-302 OUT PANEL DISPLAY	Job # Des. RES, 33Ω, 1/8W Stk. # 0012-2330 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. RES, 39Ω, 1/8W Stk. # 0012-2390 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. RES, 51Ω, 1/8W Stk. # 0012-2510 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY
b # s. RES. 47Ω, 1/8W k. # 0012-2470 y. Kit. TLE MB-302 P. DISPLAY	Job # Des. RES, 120Ω, 1/8W Stk. # 0012-3120 Qty. Kit. TITLE MB-302 F.P. DISPLAY	Job # Des. RES 100Ω, 1/8W Stk. # 0012-3100 Qty. Kit. TITLE MB-302 F.P. DISPLAY	Job # Des. RES, 160Ω, 1/8W Stk. # 0012-3160 Qty. Kit. TITLE MB-302 F.P. DISPLAY
b # s. k. # y. Kit. TLE	Job # Des. RES, 220Ω, 1/8W Stk. # 0012-3220 Qty. Kit. TITLE MB-302 F.P. DISPLAY	Job # Des. RES, 270Ω, 1/8W Stk. # 0012-3270 Qty. Kit. TITLE MB-302 F.P. DISPLAY	Job # Des. RES, 330Ω, 1/8W Stk. # 0012-3330 Qty. Kit. TITLE MB-302 F.P. DISPLAY
# # s. RES. 470Ω, 1/8W . # 0012-3470 y. Kit. TLE MB-302 F.P. DISPLAY	Job # Des. RES, 1KΩ, 1/8W Stk. # 0012-4100 Qty. Kit. TITLE MB-302 F.P. DISPLAY	Job # Des. RES, 4.7KΩ, 1/8W Stk. # 0012-4470 Qty. Kit. TITLE MB-302 F.P. DISPLAY	Job # Des. RES 5.1KΩ, 1/8W Stk. # 0012-4510 Qty. Kit. TITLE MB-302 F.P. DISPLAY
# # . RES, 200KΩ, 1/8W . # 0012-6200 . Kit. LE MB-302 DISPLAY	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE

MODEL NO. MB-302

SUBASSEMBLY ID FRONT PANEL DISPLAY

#_____	Job #_____	Job #_____	Job #_____
s._____	Des. RES, 51Ω, 1/4W	Des. RES, 750Ω, 1/4W	Des._____
k. #_____	Stk. # 0022-2510	Stk. # 0022-3750	Stk. #_____
y. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TLE_____	TITLE MB-302 F.P. DISPLAY	TITLE MB-302 F.P. DISPLAY	TITLE_____
b #_____	Job #_____	Job #_____	Job #_____
s. RES. VAR. 500 Top Adj.	Des._____	Des._____	Des. SWITCH, SLIDE, 2P5T
k. # 0333-3500J	Stk. #_____	Stk. #_____	Stk. # 9201-0007
y. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TLE MB-302 F.P. DISPLAY	TITLE_____	TITLE_____	TITLE MB-302 F.P. DISPLAY
b #_____	Job #_____	Job #_____	Job #_____
s. SWITCH, SLIDE 2P4T	Des. PB/LED, SWITCH MAINTAINED	Des. PB/LED, SWITCH MOMENTARY	Des._____
k. # 9201-0003	Stk. # 9205-0011	Stk. # 9205-0012	Stk. #_____
y. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TLE MB-302 F.P. DISPLAY	TITLE MB-302 F.P. DISPLAY	TITLE MB-302 F.P. DISPLAY	TITLE_____
b #_____	Job #_____	Job #_____	Job #_____
s._____	Des._____	Des._____	Des._____
k. #_____	Stk. #_____	Stk. #_____	Stk. #_____
y. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TLE_____	TITLE_____	TITLE_____	TITLE_____
b #_____	Job #_____	Job #_____	Job #_____
._____	Des._____	Des._____	Des._____
k. #_____	Stk. #_____	Stk. #_____	Stk. #_____
. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TLE_____	TITLE_____	TITLE_____	TITLE_____

MODEL NO. MB-[illegible]

SUBASSEMBLY ID FRONT PANEL DISPLAY

SHT 2 OF 4

#_____	Job #_____	Job #_____	Job #_____
s. I.C. 7408	Des._____	Des. I.C. MC 14490	Des._____
k. # 4012-7408	Stk. #_____	Stk. #4012-14490	Stk. #_____
y. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TLE MB-302 FRONT PANEL DISPLAY	TITLE MB-302 FRONT PANEL DISPLAY	TITLE MB 302 FRONT PANEL DISPLAY	TITLE_____
b #_____	Job #_____	Job #_____	Job #_____
s. IC. 74LS08	Des. IC 74S139	Des. TIL-308	Des. IC, 5082-7736
k. #4012-74LS08	Stk. #4012-74S139	Stk. #4513-0308	Stk. #4513-7736
y. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TLE MB-302 FRONT PANEL DISPLAY	TITLE MB-302 FRONT PANEL DISPLAY	TITLE MB-302 FRONT PANEL DISPLAY	TITLE MB-302 FRONT PANEL DISPLAY
b #_____	Job #_____	Job #_____	Job #_____
s. IC 5082-7653	Des. IC 14520	Des._____	Des. IC, MM 74C912
k. #4513-7653	Stk. #4012-14520	Stk. #_____	Stk. #4012-74C912
y. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TLE MB-302 FRONT PANEL DISPLAY	TITLE MB-302 FRONT PANEL DISPLAY	TITLE_____	TITLE MB-302 FRONT PANEL DISPLAY
b #_____	Job #_____	Job #_____	Job #_____
s. DIODE, IN4148	Des. LED, GREEN, T-1	Des. LED, YELLOW, T-1	Des. LED, RED, T-1
t. #2112-4148	Stk. # 2274-5274	Stk. # 2274-5374	Stk. # 2274-5774
y. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TLE MB-302 FRONT PANEL DISPLAY DISPLAY	TITLE MB-302 FRONT PANEL DISPLAY	TITLE MB-302 FRONT PANEL DISPLAY	TITLE MB-302 F.P. DISPLAY
b #_____	Job #_____	Job #_____	Job #_____
. TRANSISTOR 2N4401	Des. TRANSISTOR, MASSOM	Des. SOCKET PINS	Des. TRANSISTOR 2N1403
k. #3224-4401	Stk. # 9565-9083	Stk. # 9306-0004	Stk. # 3224-4403
. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TLE MB-302 FRONT PANEL	TITLE MB-302 FRONT PANEL	TITLE MB-302 FRONT PANEL	TITLE MB-302 F.P. DISPLAY

MODEL NO. MB-302 DISPLAY

SUBASSEMBLY ID FRONT PANEL

Job # Des. CAP, .01MF CHIP CAP Stk. # 1084-4710 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. CAP, 33MF, 10WVDC, MIN TANT. Stk. # 1064-1233 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. CAP, .01MF CERAMIC Stk. # 1013-8510 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. CAP, .01MF CERAMIC Stk. # 1013-8510E Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY
Job # Des. CONNECTOR, EDGE, DUAL, 22 POS, P.C. MT. Stk. # 9303-0081 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. CONNECTOR, EDGE, DUAL, 35 POS, P.C. MT. Stk. # 9303-0082 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. CONNECTOR, BNC, BULKHEAD Stk. # 9301-0001K Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. Stk. # Qty. Kit. TITLE
Job # Des. I.C. SOCKET, 16 PIN Stk. # 9300-0030 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. I.C. SOCKET, 14 PIN Stk. # 9300-0048 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. Stk. # Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY	Job # Des. PC BOARD TTOSI Stk. # 9601-0612 Qty. Kit. TITLE MB-302 FRONT PANEL DISPLAY
Job # Des. HEADER 20 PIN Stk. # 9306-0034 Qty. Kit. TITLE MB-302 F.P. DISPLAY DISPLAY	Job # Des. SOCKET, 20 PIN Stk. # 9306-0035 Qty. Kit. TITLE MB-302 F.P. DISPLAY	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. BRACKET, HOLDER BU Stk. # 9705-4418 Qty. Kit. TITLE MB-302 F.P. DISPLAY
Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE

MODEL NO. MB-302 DISPLAY KIT

SUBASSEMBLY ID FRONT PANEL

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	1	REV PER PDC00765 C.S. 11-18-80	11-24-85	BAC

WHERE APPLICABLE:
REMOVE ALL BURRS & BREAK SHARP EDGES TO 1/64.

	MB-302
NEXT ASS'Y	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES: ANGLES ±

FRACTIONS ±

3 PLACE DECIMALS ±

2 PLACE DECIMALS ±

1 PLACE DECIMALS ±

MATERIAL:

CONTR NO.

DR	C. Smith	7-2-80
CHK	MJC	7-2-80
APPD		

APPROVED

BY DIRECTION OF

tau-tron inc
Chelmsford, Ma. 01824

DRAWING TITLE
BCD INTERFACE
PARTS LIST

SIZE	CODE IDENT NO.	DRAWING NO.	REV
A		PL-54431	1

SCALE		SHEET
	MB-302	1 OF 3

NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	TAU-TRON STOCK NO.	QTY.	KIT	SHORT	PRICING COST EA.	TOTAL
1	[illegible]	RESISTOR, 2KΩ, ¼W, 5%			0022-4200	18				
2	R39	" , 10KΩ, " "			" -5100	2				
3										
4	R17	" , 100Ω, " "			" -3100	1				
5	26-29	" , 180Ω, " "			" -3180	4				
6	R21-24	" , 390Ω, " "			0022-3390	4				
7	R7,8	", 100KΩ, VARIABLE 10 TURN			0333-6100B	2				
8										
9	C2,3,7-10	CAPACITOR, .01 μf, CERAMIC			1013-8510E	6				
10	C4,5	" , 4.7 μf,			1064-3747	2				
11	C1	" , 33 μf, 10V			1064-1233	1				
12	C6	" , 33 pf			1013-8233	1				
13	C11	" , 1000 pf			1014-8410E	1				
14										
15	U2	I.C., 74LS00			4012-74LS00	1				
16	U12,17,21	" 74LS02			74LS02	3				
17	U5,9	" 74LS04			74LS04	2				
18	U19	" 7407			7407	1				
19	U16	74LS11			74LS11	1				
20	U10	74LS74			74LS74	1				
21	U13	74LS76			74LS76	1				
22	U3,6	74LS123			74LS123	2				
23	U15	74LS138			74LS138	1				
24	U4,7,22	74LS157			74LS157	3				
25	U1,3,11,14,18									
26	20	74LS175			4012-74LS175	6				

TITLE BCD INTERFACE PARTS LIST	SHEET 2 OF 3	JOB NO.	QTY.	TOTAL COST
DRAWING NUMBER PL-54431	REV 1	SUBMITTED BY:		DATE:
		KITTED BY		DATE:

NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	TAU-TRON STOCK NO.	QTY.	KIT	SHORT	PRICIN COST EA.	TOTAL
27		MALE POST			9303-0003	2				
28										
29										
30	J1	HEADER, PT ANGLE, 50 PIN	ANSLEY	509-5007ES	9306-0039	1				
31		WITH EJECTOR RETAINER								
32										
33	J2,3	HEADER, 1" PIN DIP	ANSLEY	609-1678	9306-0012	2				
34										
35										
36										
37										
38										
39										
40		P.C. BD. ARTWORK	TAU-TRON	TT0638-1	9601-0638	1				
41		ASSEMBLY			TDK-54431	REF				
42		FABRICATION			TDG-54430	REF				
43		SCHEMATIC			TCJ-54429	REF				
44										
45										
46										
47										
48										
49										
50										
51										
52										

TITLE BCD INTER FACE · PARTS LIST	SHEET 3 OF 3	JOB NO.	QTY.	TOTAL COST	
DRAWING NUMBER PL-54431	REV 1	SUBMITTED BY:		DATE:	
		KITTED BY		DATE:	

Job # Des. 2KΩ RESISTOR 1/4W Stk. # 0022-4200 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 10 KΩ RESISTOR, 1/4W Stk. # 0022-5100 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 100KΩ RESISTOR, 1/4W Stk. # 0022-6100 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. .01uf CERAMIC CAPACITOR Stk. # 1013-8510 Qty. Kit. TITLE BCD INTERFACE MB-302
Job # Des. 4.7uf CAPACITOR Stk. # 1064-3747 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 33uf, 10V CAP Stk. # 1064-1233 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 33pf CAPACITOR Stk. # 1013-8233 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 74LS00 IC Stk. # 4012-74LS00 Qty. Kit. TITLE BCD INTERFACE
Job # Des. 74LS02 IC Stk. # 4012-74LS02 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 74LS04 IC Stk. # 4012-74LS04 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 7407 IC Stk. # 4012-7407 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 74LS11 IC Stk. # 4012-74LS11 Qty. Kit. TITLE BCD INTERFACE MB-302
Job # Des. 74LS74 IC Stk. # 4012-74LS74 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 74LS76 IC Stk. # 4012-74LS76 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 74LS123 IC Stk. # 4012-74LS123 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 74LS138 IC Stk. # 4012-74LS138 Qty. Kit. TITLE BCD INTERFACE MB-302
Job # Des. 74LS157 IC Stk. # 4012-74LS157 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 74LS175 IC Stk. # 4012-74LS175 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. P.C. BOARD Stk. # 9601-0638 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 100Ω RESISTOR Stk. # 0022-3100 Qty. Kit. TITLE BCD INTERFACE MB-302

MODEL NO. MB-302

SUBASSEMBLY ID BCD INTERFACE

Job # es. 180Ω RESISTOR tk. # 0022-3180 ty. Kit. ITLE BCD INTERFACE MB-302	Job # Des. 390Ω RESISTOR Stk. # 0022-3390 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. 1000pf CAP Stk. # 1014-8410E Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. MALE POST Stk. # 9303-0003 Qty. Kit. TITLE BCD INTERFA MB-302
ob # es. HEADER 50 PIN RT ANGLE tk. # 9306-0039 ty. Kit. ITLE BCD INTERFACE MB-302	Job # Des. 16 PIN DIP HEADER Stk. # 9306-0012 Qty. Kit. TITLE BCD INTERFACE MB-302	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE
b # es. tk. # ty. Kit. ITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE
ob # es. tk. # ty. Kit. TLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE
b # . k. # . Kit. TLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE	Job # Des. Stk. # Qty. Kit. TITLE

MODEL NO. MB-302

SUBASSEMBLY ID BCD INTERFACE

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED	
	1	REVISED & REDRAWN C.S. 7-8-80			
	2	REVISED & REDRAWN PER PDC00760, J.J. 11-4-80	11-11-80	BAC	PEG

WHERE APPLICABLE:
REMOVE ALL BURRS & BREAK SHARP EDGES TO 1/64.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: ANGLES ±
FRACTIONS ±
3 PLACE DECIMALS ±
2 PLACE DECIMALS ±
1 PLACE DECIMALS ±

MATERIAL:

CONTR NO.

DR	J.J.	11-4-80
CHK	R. Cooper	11-11-80
APPD	[illegible]	11 11 80

APPROVED

BY DIRECTION OF

tau-tron inc
Chelmsford, Ma. 01824

DRAWING TITLE
PL-CODE RESYNC

SIZE	CODE IDENT NO.	DRAWING NO.	REV
A		PL-54364	2

SCALE ~ | MB-302 | SHEET 1 OF 4

	MB-302
NEXT ASS'Y	USED ON
APPLICATION	

ITEM NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	STOCK NO.	QTY.	KIT	SHORT	COST EA.	TOTAL
1		SCHEMATIC	TAN-TRON	TDJ-54363		REF				
2		ARTWORK	"	TT-0613-2	9601-0613	1				
3		FABRICATION	"	TDG-54365		REF				
4		ASSEMBLY	"	TDK-54364		REF				

TITLE: PL-CODE RESYNC	SHEET 2 OF 4	JOB NO.	QTY.	TOTAL COST
		SUBMITTED BY:		DATE:
DRAWING NUMBER: PL-54364-1	REV 2	KITTED BY		DATE:

ITEM NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	TAC FROM STOCK NO.	QTY.	KIT	SHORT	PRICING COST EA.	TOTAL
5		CAPACITOR .01uf CHIP	VITRAMON	VJ08-[illegible]MH	1164-1710	4				
6		" .01uf CERAMIC	VITRAMON	VK20BX103K	1613-8510	60				
7		" 33uf 10V	[illegible]	[illegible]	1164-1235	6				
8		" 4.7uf	"	MMS-020-475R-20	1064-5747	1				
9		" 1uf, 35V	SPRAGUE	150D105X9035A2	1064-5110	2				
10		CONNECTOR PC TYPE	SEALECTRO	50-051-0000	9301-0060A	3				
11		DIODE	FAIRCHILD	1N4148	2116-4148	1				
12		IC 1688F FLATPACK	FAIRCHILD	MC1688F	1012-[illegible]	4				
13		IC F100102 FLATPACK	FAIRCHILD	F100102FC	1155-0102	1				
14		IC F100131 FLATPACK	FAIRCHILD	F100131FC	1155-0131	1				
15		IC 1662 16PIN DIP	[illegible]	MC1662L	1012-1662	4				
16		IC 1672		MC1672L	-1672	1				
17		IC 1678		MC1678	-1678	2				
		IC 1692		MC1692L	-1692	1				
		IC 11C70	FAIRCHILD	11C70DC	-11C70	1				
		IC 10016	FAIRCHILD	F10016PC	-10016	1				
21		IC 10102	MOTOROLA	MC10102P	-10102	4				
		IC 10105		MC10105P	-10105	1				
		IC 10124		MC10124P	-10124	3				
		IC 10125		MC10125P	-10125	3				
		IC 10131		MC10131P	-10131	1				
		IC 10141		MC10141P	-10141	5				
		IC 10178		MC10178P	-10178	1				
25		IC 10198 16PIN DIP	MOTOROLA	MC10198P	4012-10198	1				

TITLE
PL- CODE RESYNC

SHEET 3 OF 4

JOB NO.

QTY.

TOTAL COST

SUBMITTED BY:

DATE:

DRAWING NUMBER PL-54364

REV 2

KITTED BY

DATE:

ITEM NO.	REF. DES.	COMPONENT DESCRIPTION	MFG.	MFG. PART NUMBER	TAU-TRON STOCK NO.	QTY.	KIT	SHORT	PRICING COST EA.	PRICING TOTAL
2		IC [illegible]	[illegible]	MC1021P	4012-1021	2				
[illegible]		IC [illegible]	"	MC1012P	" -1012	1				
[illegible]		IC [illegible]	"	MC1216P	" -1016	1				
2		IC10231	MOTOROLA	MC10231P	4012-1023	6				
[illegible]		[illegible]	NATIONAL	[illegible]	1241-227T	1				
24		RESISTOR, 51Ω 1/8W ± 5%	ALLEN-BRADLEY	TYPE BB	1012-2510	7				
5		" 75Ω	"	"	" -2750	29				
6		" 100Ω			" -3100	6				
7		" 470Ω			" -3470	53				
8		" 1K-Ω 1/8W ± 5%			" -4100	10				
9		" 75Ω 1/4W ± 5%		TYPE CB	1012-2750	1				
0		RESISTOR 120Ω " "	ALLEN-BRADLEY	TYPE CB	1012-3120	1				
		RESISTOR 10KΩ, 1/8W ± 5%	ALLEN-BRADLEY	TYPE BB	1012-5100	1				
1		RESISTOR PAK 470Ω 8PN SIP	BECKMAN	784-1-R470	0822-3470	5				
2		TRIM POTENTIOMETER, 1K	BOURNS	3299X-1-102	0373-4100T	3				

TITLE: PL-CODE RESYNC	SHEET 4 OF 4	JOB NO.	QTY.
DRAWING NUMBER: PL-54364	REV 2	SUBMITTED BY:	DATE:
		KITTED BY	DATE:

TOTAL COST

Job #_____	Job #_____	Job #_____	Job #_____
Des. IC	Des. IC	Des. IC	Des. IC
Stk. #4012-10131	Stk. #4012-10141	Stk. #4012-10178	Stk. #4012-10192
Qty. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC
Job #_____	Job #_____	Job #_____	Job #_____
Des. IC	Des. IC	Des. IC	Des. REGULATOR
Stk. #4012-10211	Stk. #4012-10216	Stk. #4012-10231	Stk. #4201-337T
Qty. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC
Job #_____	Job #_____	Job #_____	Job #_____
Des. RESISTOR	Des. RESISTOR	Des. RESISTOR	Des. RESISTOR
Stk. #0012-2510	Stk. #0012-2750	Stk. #0012-3100	Stk. #0012-3470
Qty. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC
Job #_____	Job #_____	Job #_____	Job #_____
Des. RESISTOR	Des. RESISTOR	Des. RESISTOR	Des. SIP PAK
Stk. #0012-4100	Stk. #0022-2750	Stk. #0022-3120	Stk. #0822-3470
Qty. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC
Job #_____	Job #_____	Job #_____	Job #_____
Des. TRIM POT	Des. P.C. BOARD	Des._____	Des._____
Stk. #0322-4100T	Stk. #9201-0613	Stk. #_____	Stk. #_____
Qty. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE_____	TITLE_____

MODEL NO. MB-202

SUBASSEMBLY ID PL-54364

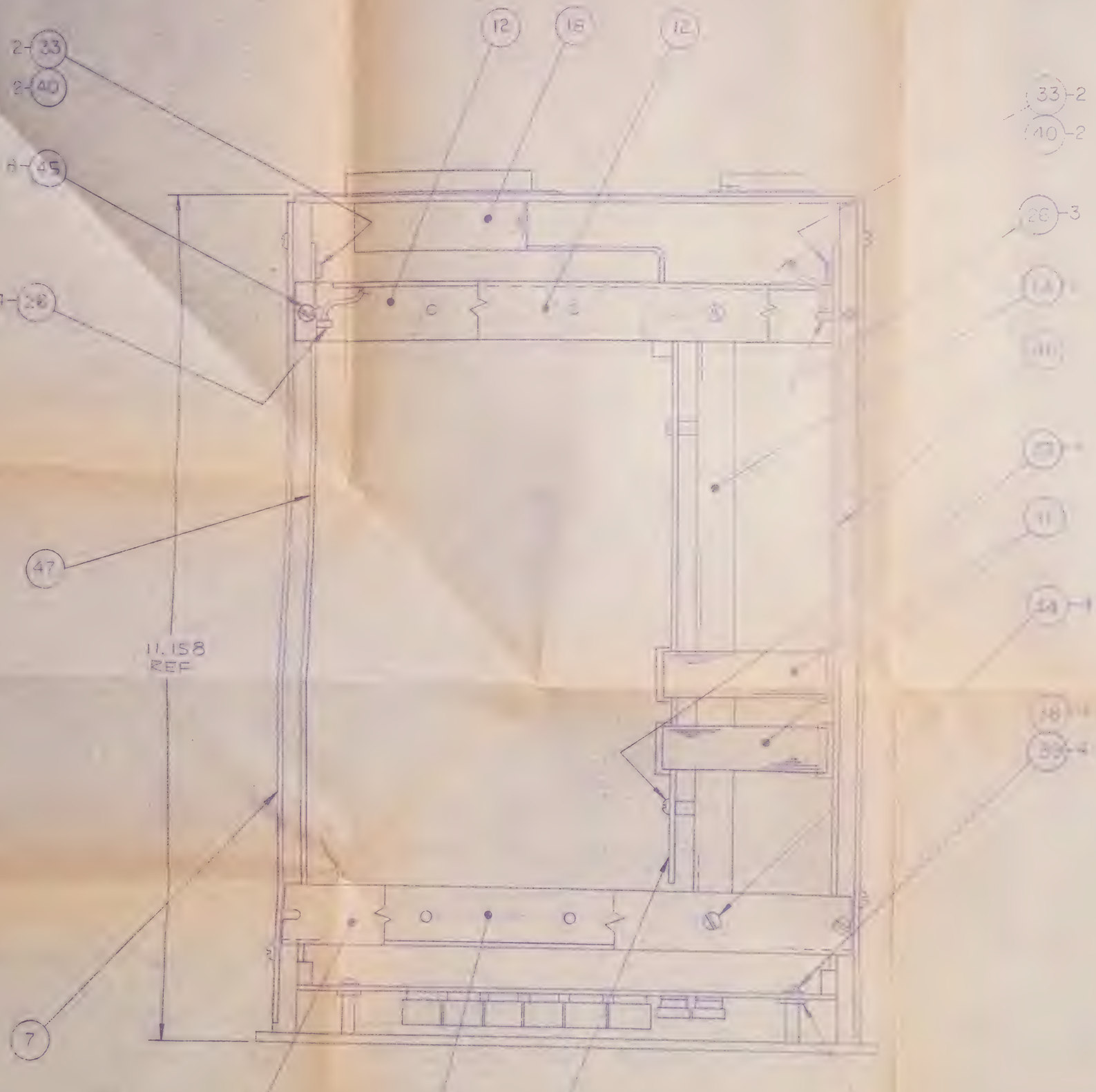
#_____	Job #_____	Job #_____	Job #_____
. CAPACITOR	Des. CAPACITOR	Des. CAPACITOR	Des. CAPACITOR
. # 1084-4710	Stk. # 1013-8510	Stk. # 1064-1233	Stk. # 1064-3747
. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
LE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC
#_____	Job #_____	Job #_____	Job #_____
. CAPACITOR	Des. CONNECTOR	Des. DIODE	Des. IC
. # 1024-5110	Stk. # 9301-0060A	Stk. # 2116-4148	Stk. # 4012-1699
. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
LE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC
#_____	Job #_____	Job #_____	Job #_____
. IC	Des. IC	Des. IC	Des. IC
. # 4055-0102	Stk. # 4055-0131	Stk. # 4012-1662	Stk. # 4012-1672
. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
LE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC
#_____	Job #_____	Job #_____	Job #_____
. IC	Des. IC	Des. IC	Des. IC
. # 4012-1678	Stk. # 4012-1692	Stk. # 4012-11670	Stk. # 4012-10016
. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
LE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE
#_____	Job #_____	Job #_____	Job #_____
. IC	Des. IC	Des. IC	Des. IC
. # 4012-10102	Stk. # 4012-10105	Stk. # 4012-10124	Stk. # 4012-10125
. Kit._____	Qty. Kit._____	Qty. Kit._____	Qty. Kit._____
LE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC	TITLE CODE RESYNC

MODEL NO. MB-50[illegible]

SUBASSEMBLY ID PL-54364

8 7 6 5

H G F E



33-2
40-2
28-3
(A)
(11)
(7)
11
34-1
38-1
39-4

4 3 2 1

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	1	CHANGE PER ECN [illegible]		
	2	REV PER PDC [illegible]	7-1-80	
	3	REVISED PER PDC DATED [illegible]	10-31-80	
	4	ADD PER PDC 00365	11-12-80	

H

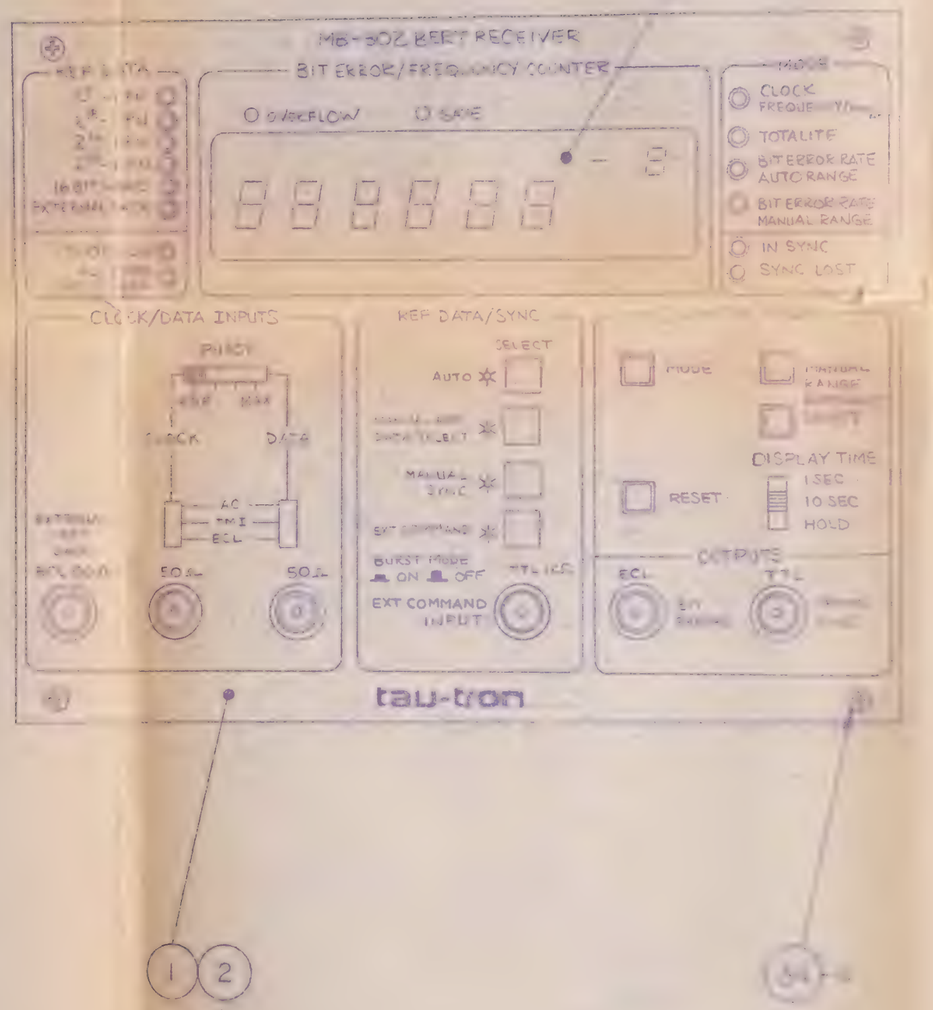
G

F

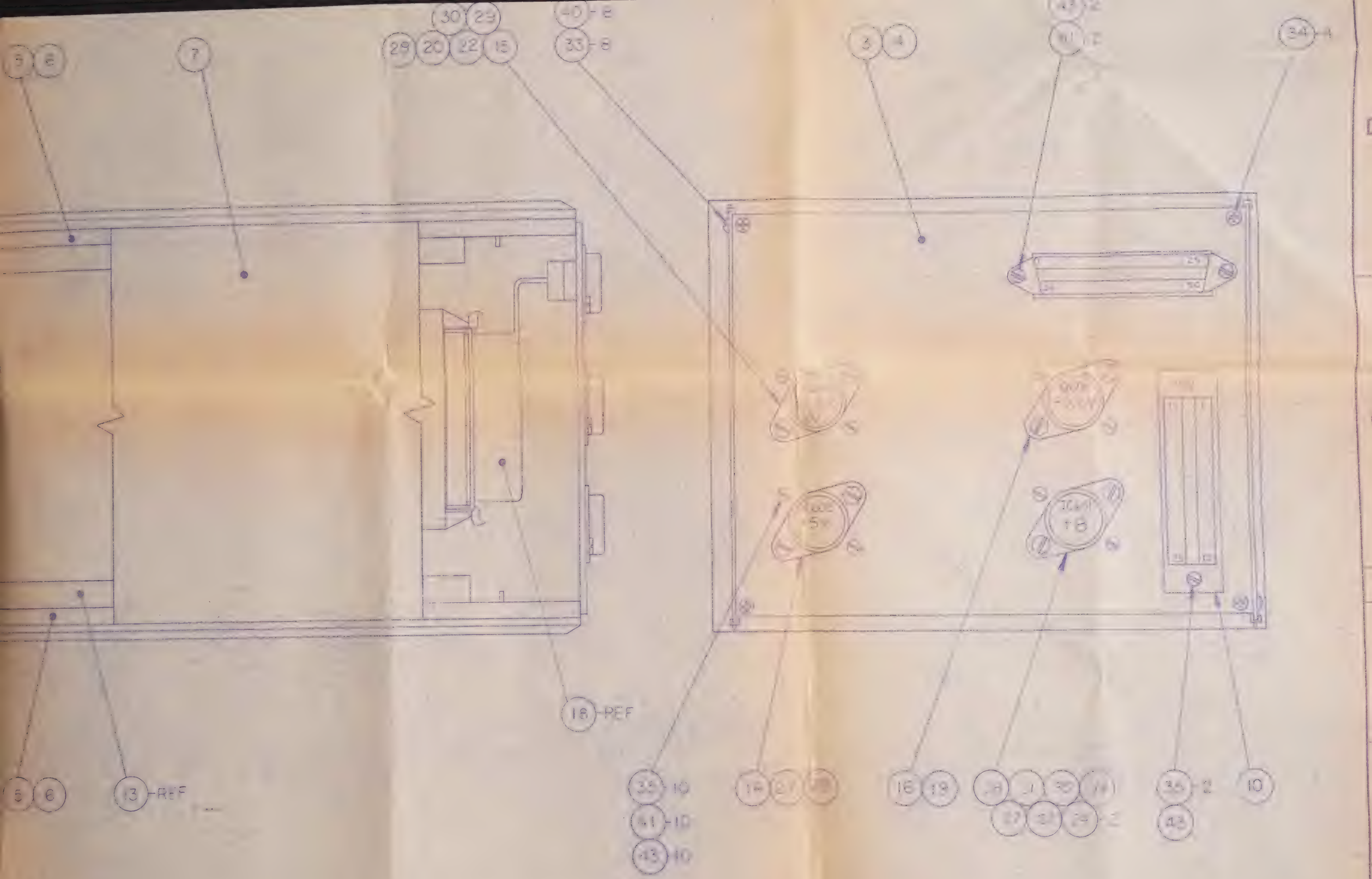
E

(35)-1

(43)-2


MB-902 BERT RECEIVER
BIT ERROR/FREQUENCY COUNTER
OVERFLOW
SAFE
MODE
CLOCK FREQUENCY
TOTALITE
BIT ERROR RATE AUTO RANGE
BIT ERROR RATE MANUAL RANGE
IN SYNC
SYNC LOST
CLOCK/DATA INPUTS
REF DATA/SYNC
SELECT
AUTO
MANUAL SYNC
BURST MODE ON OFF
EXT COMMAND INPUT
MODE
RESET
DISPLAY TIME
1 SEC
10 SEC
HOLD
OUTPUTS
ECL
TTL
50Ω
50Ω
tau-tron

REF



WHERE APPLICABLE: REMOVE ALL BURRS & BREAK SHARP EDGES TO 1/64	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES ± FRACTIONS ± 3 PLACE DECIMALS ± 2 PLACE DECIMALS ± 1 PLACE DECIMALS ±
NEXT ASSY / USED ON	MATERIAL:
APPLICATION	

CONTR NO.	tau-tron inc Chelmsford, Ma. 01824
DR	
CHK	DRAWING TITLE: MB-302 MODULE ASSEMBLY
APPD	
APPROVED	SIZE: E / CODE IDENT NO. / DRAWING NO.: TEK-54424 / REV: A
BY DIRECTION OF	SCALE: 1/1 / SHEET

	REVISED, REDRAWN P.C.	7-11-80

LAYER 1

NOTES:
1. UNLESS OTHERWISE SPECIFIED
   A. RESISTOR VALUES ARE IN OHMS, 1/8 W, ± 5%.
   B. CAPACITOR VALUES ARE IN MICROFARADS.
   C. ⬭ DENOTES .01 uf CERAMIC CAPACITOR.
2. ALL MARKED CAPACITORS ARE .01 uf.
3. X VALUE TO BE DETERMINED IN TEST.
4. PLACE A PERMANENT REVISION LEVEL MARK ON THE ASSEMBLY IN THE DESIGNATED [illegible]

TOP VIEW

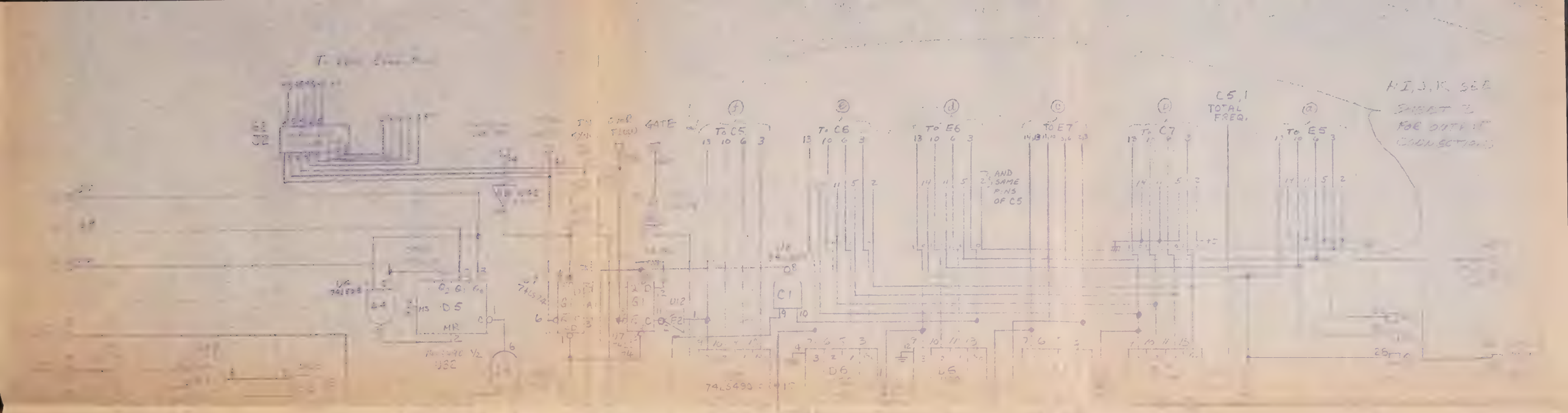
NEXT ASS'Y	APPLICATION	

Pau-tron

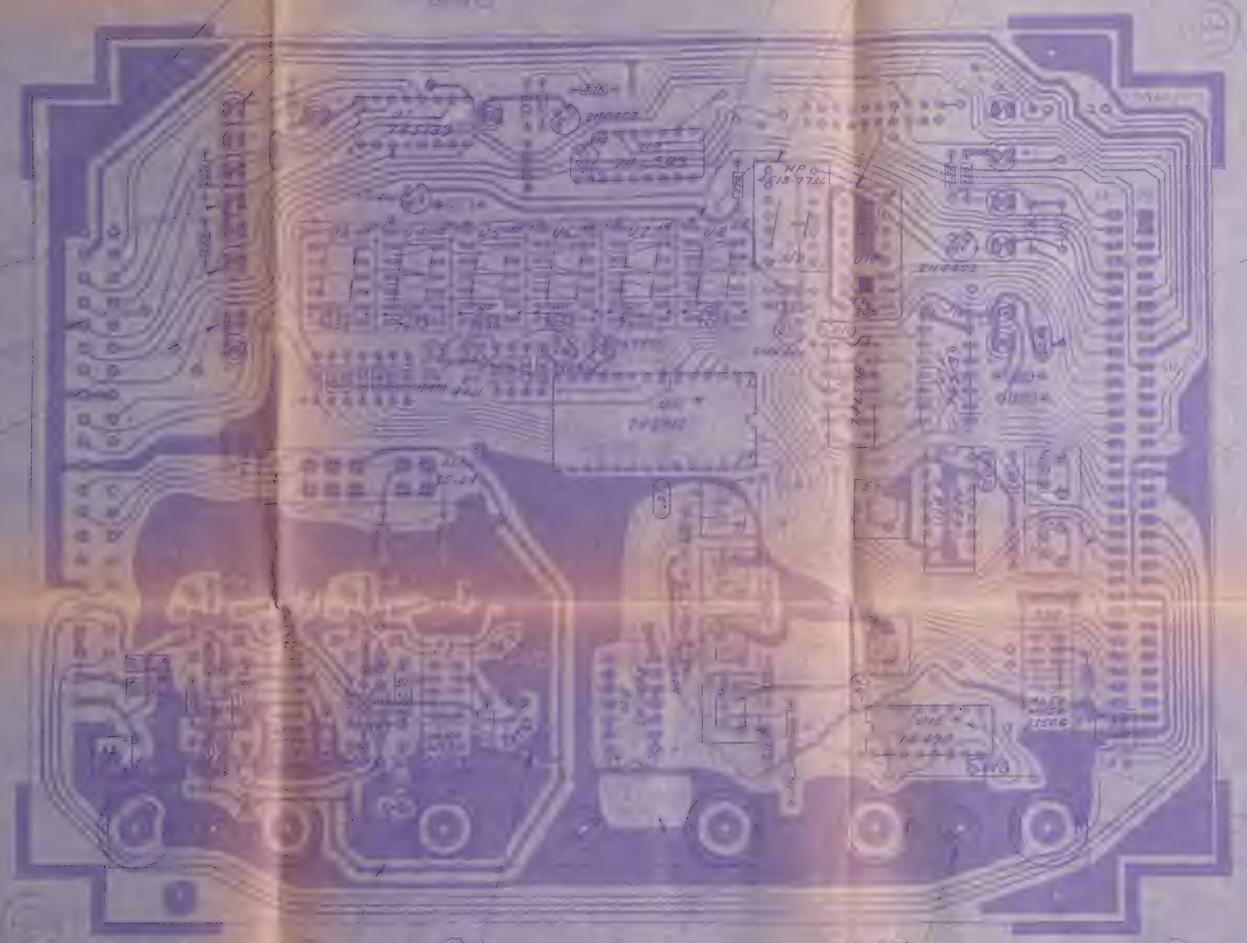
ASSEMBLY,
COUNTER BOARD XTT0620

TDK-54362

SIZE | JAB-302


TO C5
TO C6
TO E6
TO E7
TO C7
TO E5
C5,1 TOTAL FREQ.
AND SAME PINS OF C5
SHEET 2 FOR OUTPUT CONNECTIONS
74LS490
74LS374
74LS00
74LS02
74LS32
74LS08
74LS86
74LS04
74LS74
74LS93
74LS123
74LS221
74LS00
14 PIN DIP OSCILLATOR

	1	REVISED & REDRAWN
	2	REDRAWN - PDC 00759



SEE SH. 1

(67)

CRIMP A SINGLE CONDUCTOR, FROM AN ANCLEY FLAT RIBBON CABLE, BETWEEN OPPOSITE PINS OF THE CONNECTOR (10 PLACES). THEN INSERT CONNECTOR (67) INTO P3 HEADER (66).

(66)

(67)

P3

(70)

(69)

(60)

TO CODE RESYNC BOARD DATA IN

TO CODE RESYNC BOARD CLK IN

TO CODE RESYNC BOARD

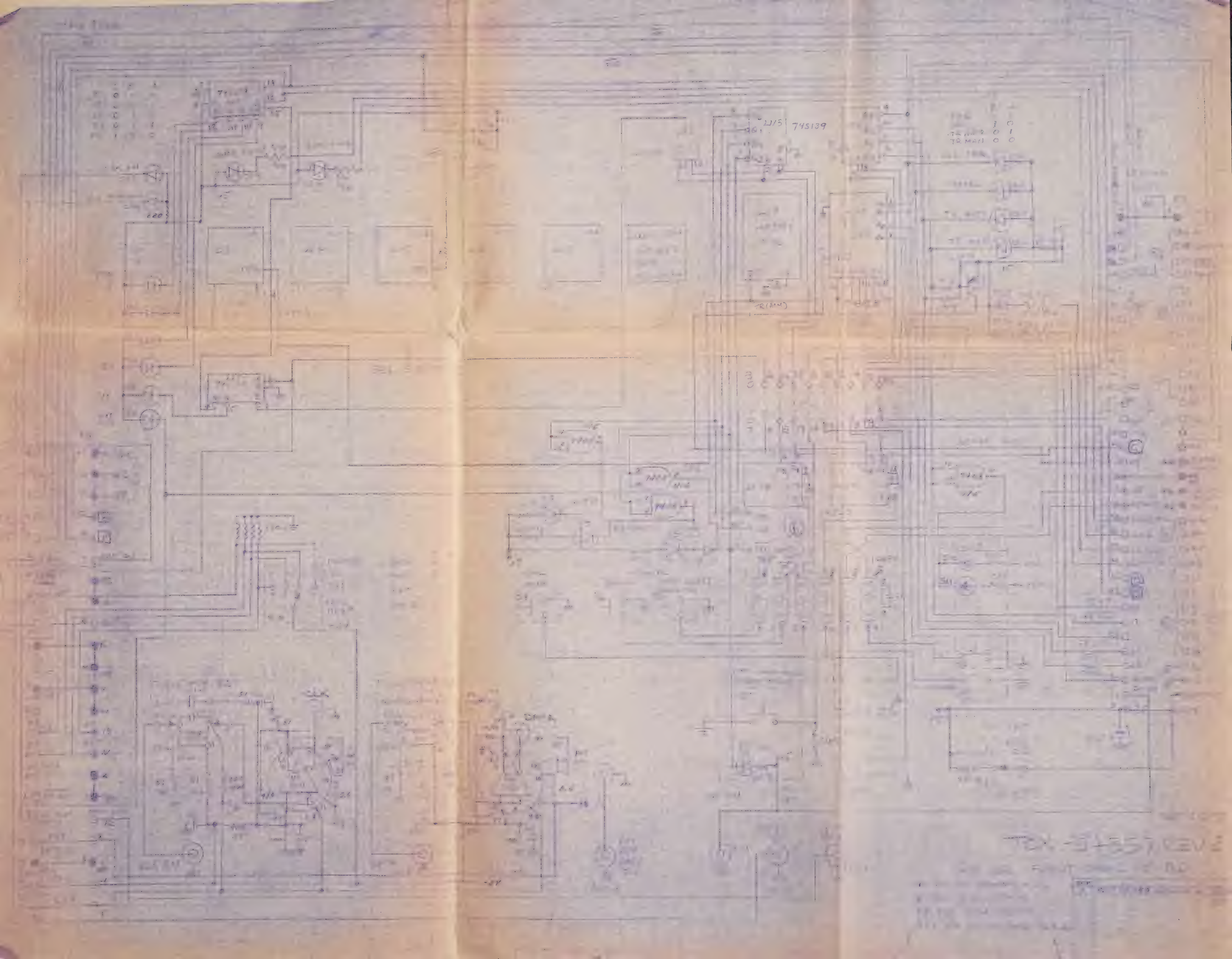
NOTE 4

WIRING SIDE

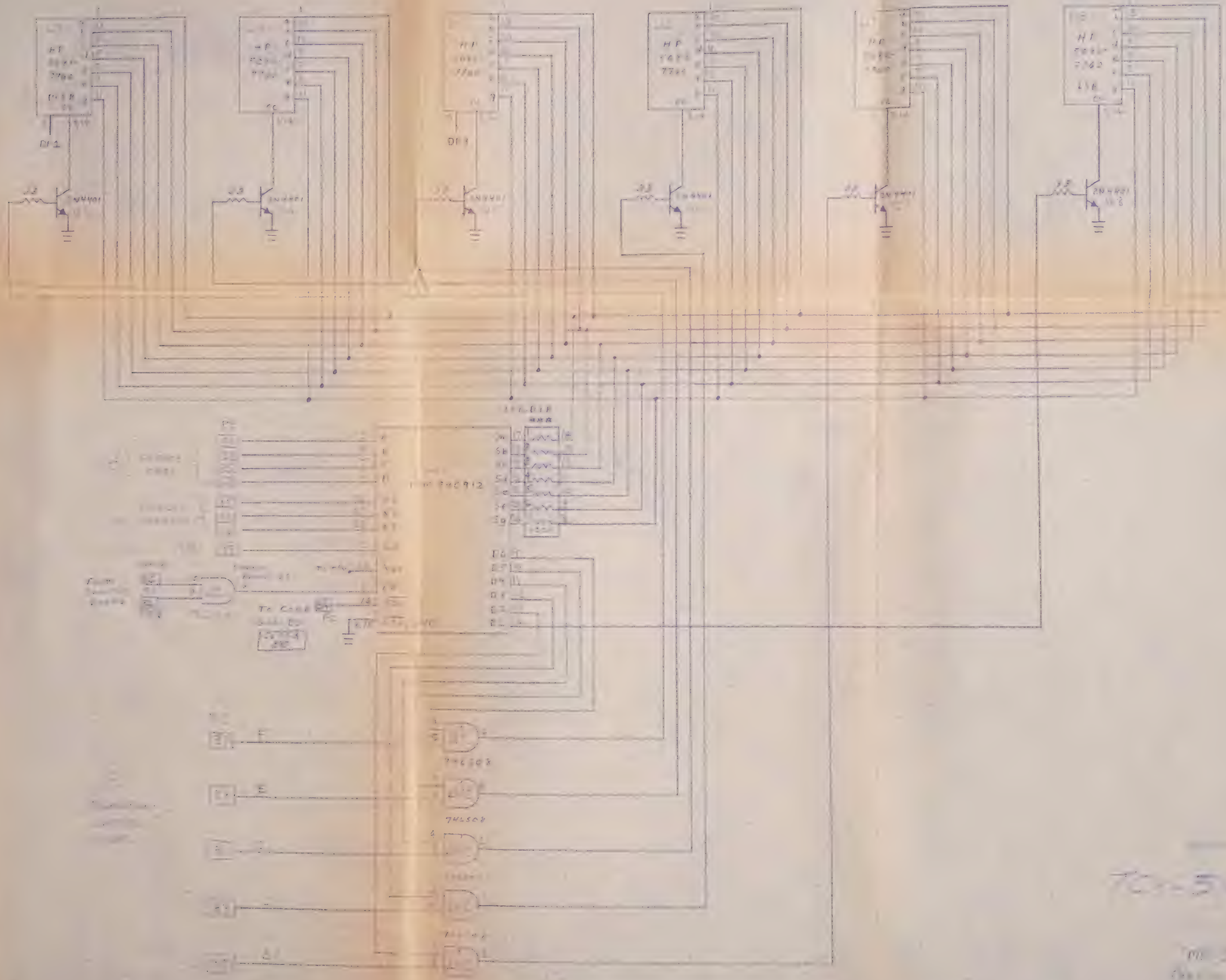
(75)(76) REF

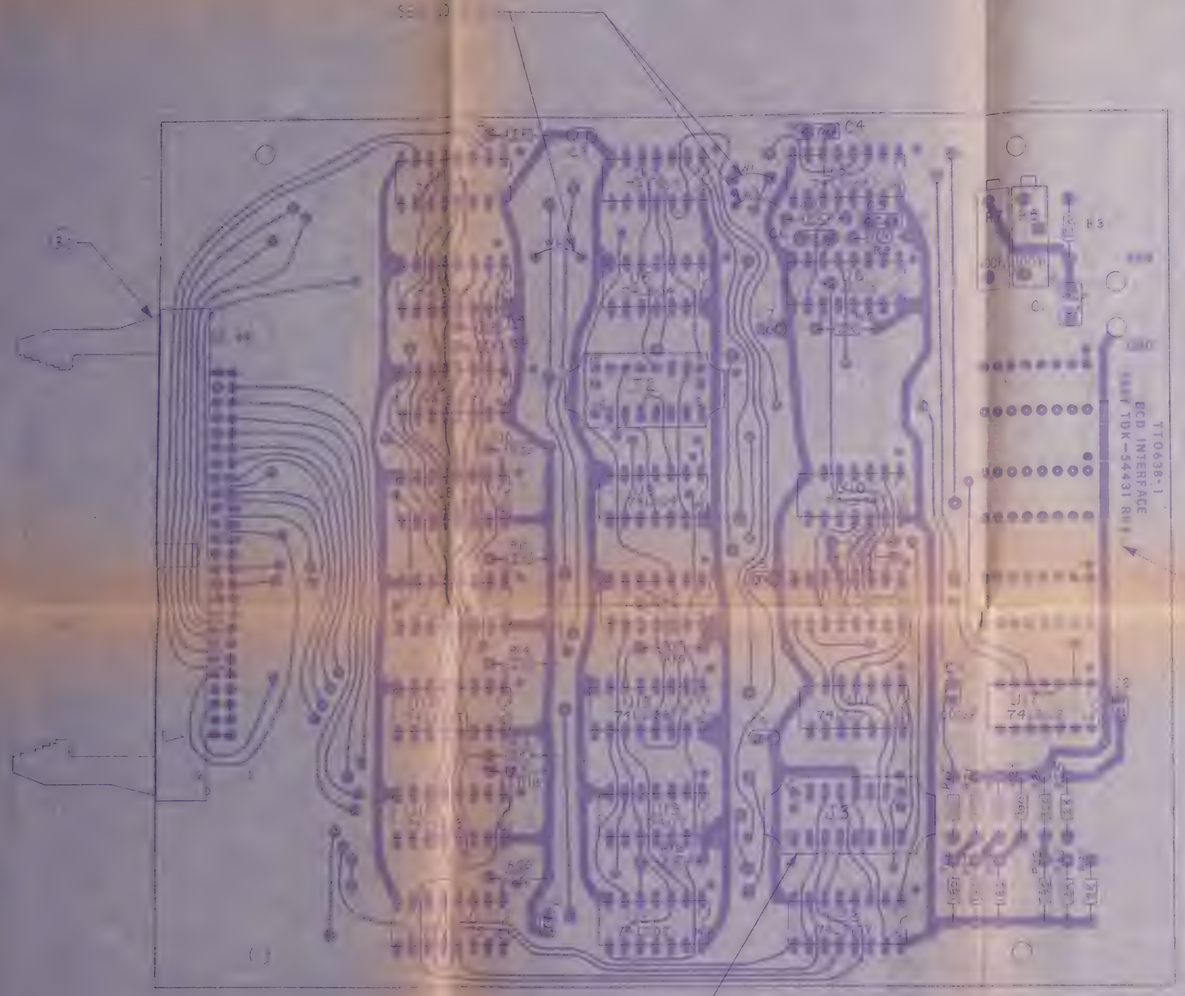
(63) 12 PLCS EACH, U17 & U18

CONTR NO		tau-tron inc Chelmsford, Ma. 01824
DRN [illegible]	[illegible]	DRAWING TITLE: PCB ASSEMBLY, FRONT PANEL DISPLAY
CHK [illegible]	10-12-84	
APPD		
APPROVED		SIZE: D; CODE IDENT NO.; DRAWING NO.: TDK-54359; REV: E
BY DIRECTION OF		SCALE: 2/1; SHEET: 2 of 3



REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	J	REVISED PER ECO [illegible]	7-19-80	




TT0638-1
BCD INTERFACE
TDK-54431 REV
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10
J11
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J40

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	1	ADDED 2 JUMPERS AT U3 S.MULAWICKI		

74LS138

74LS123

74LS157

74LS175

74LS02

74LS00

74LS86

74LS393

74LS76

74LS04

74LS10

74LS08

74LS32

74LS27

74LS20

74-07

TO 50 PIN INTERFACE CONN.

TIME RATE AUTO

TIME RATE MAN.

FREQUENCY

DECIMAL PT. 000.000

TOTALIZE

IN SYNC.

SYNC. LOST

OVERFLOW

FROM COUNTER BD.

+5V

+12V

-12V

10K

100K 10 TURN

JUMPER

R1 180

R2 180

R3 180

R4 330

R5 180

R6 180

R7 180

R8 180

R9 180

R10 180

R11 180

R12 180

R13 180

R14 180

R15 180

R16 2K

R17 180

R18 180

R19 180

R20 180

R21 180

R22 180

R23 180

R24 180

R25 180

R26 180

R27 180

R28 180

R29 180

R30 2K

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R986 2K

R987 2K

R988 2K

R989 2K

R990 2K

R991 2K

R992 2K

R993 2K

R994 2K

R995 2K

R996 2K

R997 2K

R998 2K

R999 2K

R1000 2K

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   - RESISTANCE VALUES ARE IN OHMS ¼W ± 5%.
   - CAPACITANCE VALUES ARE IN MICROFARADS.
2. 74LS76 DOES NOT USE STANDARD VOLTAGE PIN OUT.
3. DENOTES 16 PIN CONNECTOR.

WHERE APPLICABLE: REMOVE ALL BURRS & BREAK SHARP EDGES TO 1/64.	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: ANGLES ±
FRACTIONS ±
3 PLACE DECIMALS ±
2 PLACE DECIMALS ±
1 PLACE DECIMALS ±
MATERIAL:

CONTR NO.
DR C. ATHERTON
CHK
APPD
APPROVED
BY DIRECTION OF

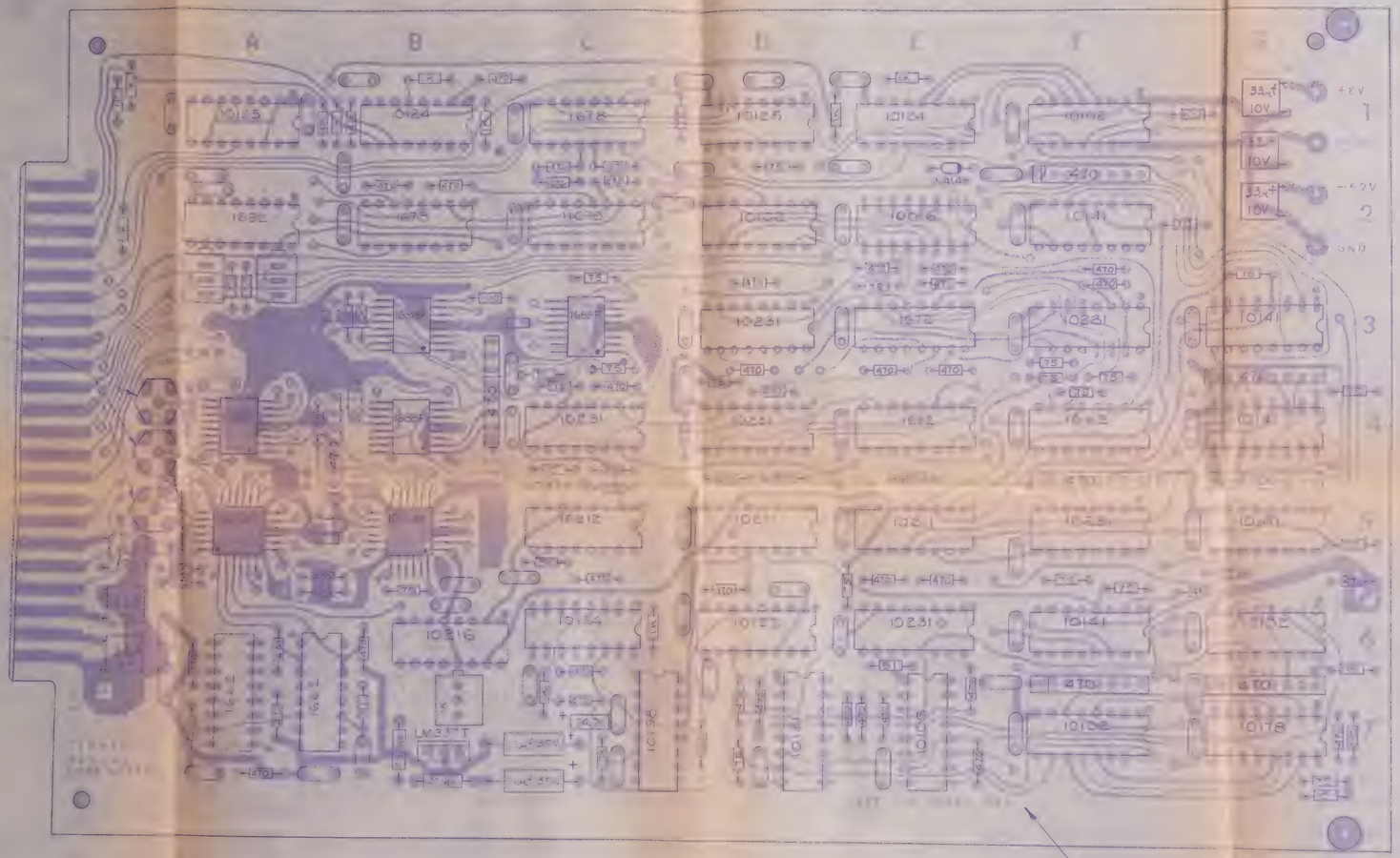
tau-tron inc
Chelmsford, MA 01824

DRAWING TITLE:

SIZE	CODE IDENT NO.	DRAWING NO.	REV
C		TD-5[illegible]	

SCALE
SHEET

1	[illegible]	[illegible]	[illegible]	[illegible]	SAM
2	[illegible]	[illegible]	11-17-80	B+C	[illegible]



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTORS ARE IN OHMS, 1/8W, ±5%.
   B. CAPACITORS ARE IN MICROFARADS.
   C. ▭ INDICATES .01µf CHIP CAPACITORS.
   D. ⬭ INDICATES .01µf CERAMIC CAPACITORS.
2. PLACE A PERMANENT REVISION LEVEL MARK ON THE ASS'Y IN THE DESIGNATED AREA.
3. SEE SHEET 2 FOR DELAY LINES

SEE NOTE 4

WIRING SIDE

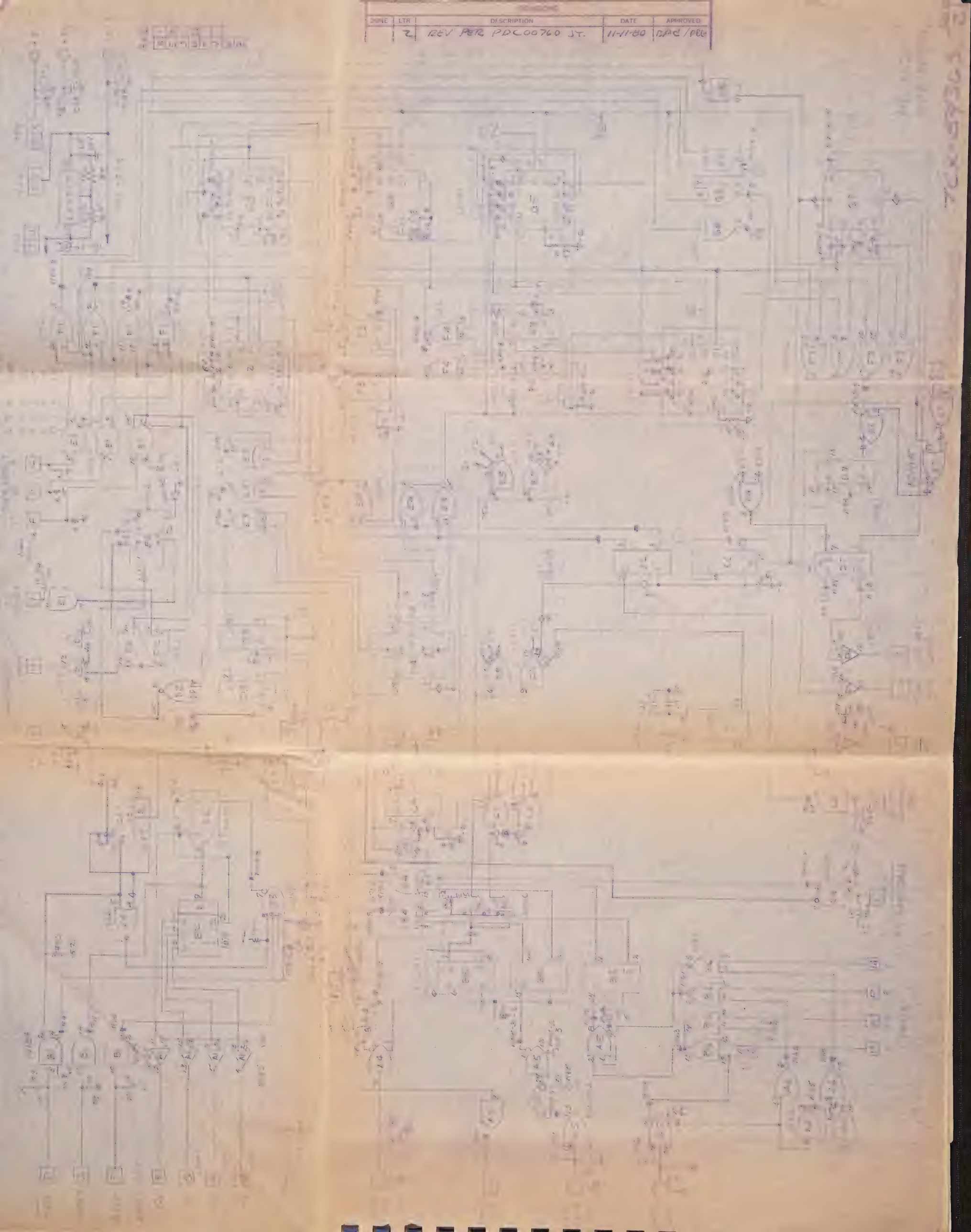
SEE NOTE 4

ASSEMBLY
CODE RESYNC

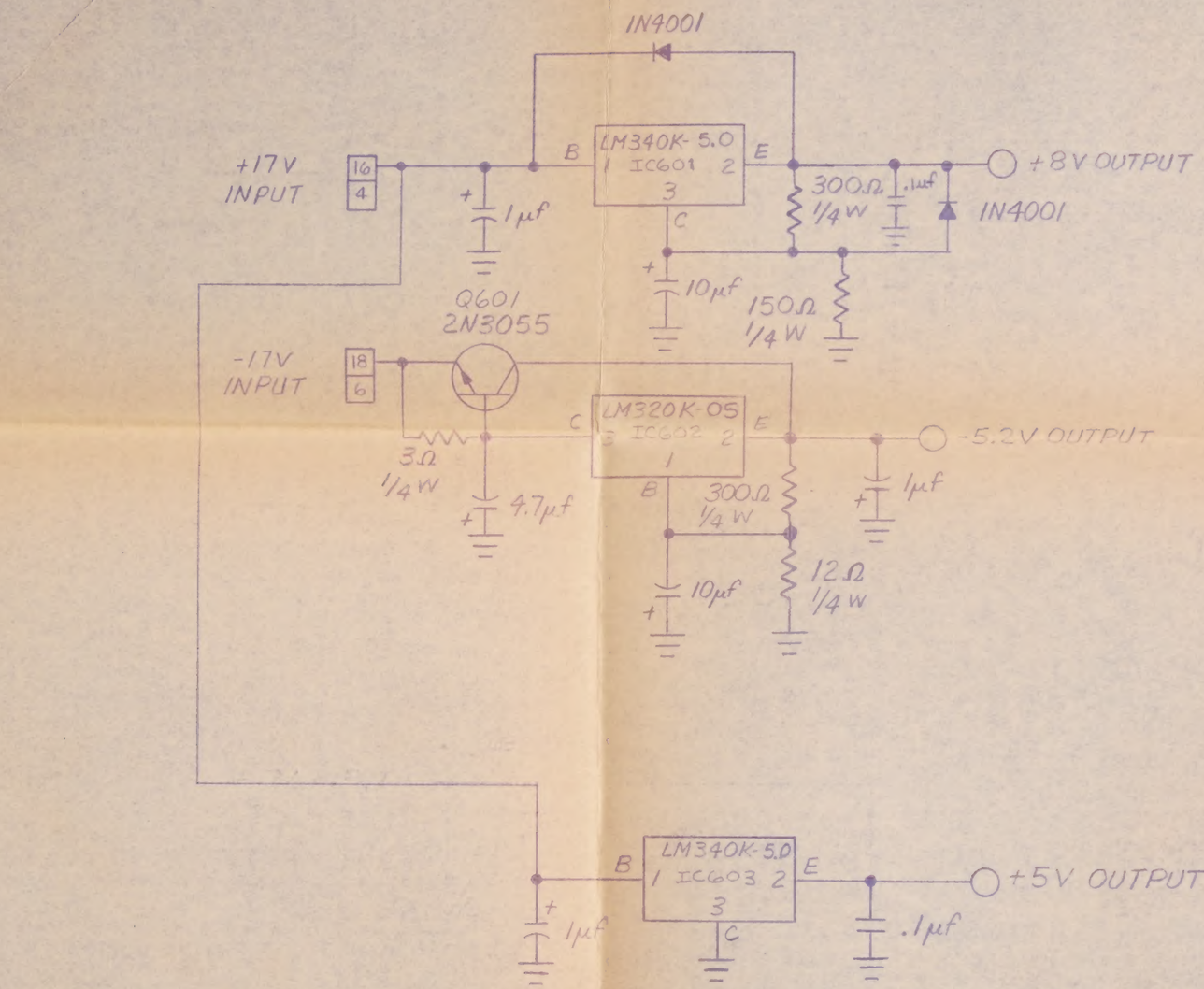
TDK-5436-4

TDK-5436-4

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	2	REV PER PDC00760 ST.	11-11-80	DAC / PEC



REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	1	DELETE +5 BOOST TRANSISTOR KRW		
	2	REV PER PDC 00785 CA	11-13-80	BAC



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   A. RESISTANCE VALUES ARE IN OHMS, ±5%, 1/4W.
   B. CAPACITANCE VALUES ARE IN MICROFARADS.
2. ☐ INDICATES 24 PIN POWER CONNECTOR.

WHERE APPLICABLE: REMOVE ALL BURRS & BREAK SHARP EDGES TO 1/64.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	CONTR NO.	tau-tron INC Chelmsford, Ma. 01824
	TOLERANCES: ANGLES ± —	DR KRW 5 Jan 80	DRAWING TITLE
	FRACTIONS ± —	CHK MJC 18 Jan 80	MB-302 POWER SUPPLY SCHEMATIC +8V, +5V, -5V BOOST
	3 PLACE DECIMALS ± —	APPD	
	2 PLACE DECIMALS ± —		
	1 PLACE DECIMALS ± —		
TCJ-54424 / MB-302	MATERIAL:	APPROVED	SIZE C / CODE IDENT NO. / DRAWING NO. TCJ-54421 / REV 2
NEXT ASSY / USED ON		BY DIRECTION OF	SCALE NONE / TM1 SERIES / SHEET 1 OF 1
APPLICATION			

07-0043 (8/71) .003 MYLAR

27 Industrial Avenue, Chelmsford, MA 01824 (617) 256-9013